SEPTEMBER 1952

TECHNOLOGY DEPT.

The Paper Industry

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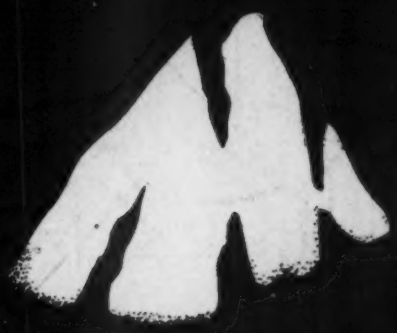
DETROIT

STABILIZED *Sodium Aluminate*



100% Soluble
100% Stable • 100% Available

NALCO 680 is *completely* soluble, *completely* stable...the one sodium aluminate that remains in solution as sodium aluminate and does not settle out.

Every ounce of Nalco 680 provides active alkaline alumina... always available for rapid reaction. That means reduced alum requirements, lower acidity, better sizing, better retention, and therefore, better products.

Read the results reported at right—then ask a Nalco Representative to show you how Nalco 680 can repeat them in your mill.

BOX BOARD MILL—Power Savings

"Machine tenders report much better sheet formation with Nalco 680, and that jordans can be cut back 10 amps. Machines are cleaner with no deposits on cylinders."

KRAFT MILL—Alumina Retention

"Improvement in sizing, better retention of alumina, and general texture of the sheet using Nalco 680 are very marked. Converter reports the sheet handles better."

SULFITE BOND MILL—45% Less Alum

"Results using Nalco 680 at the rate of five pounds per ton have been good. Improved sizing and reduced alum from 250 to 140 pounds per 4500 pounds of furnish. This enabled the mill to meet rigid pH specifications for the paper."

TISSUE MILL—Clean Machines

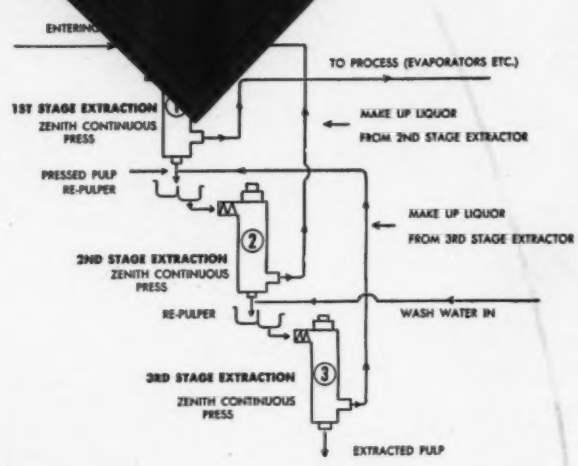
"No. 6 paper machine remaining clean and generally good results through the use of Nalco 680 applied at the rate of four pounds per ton."

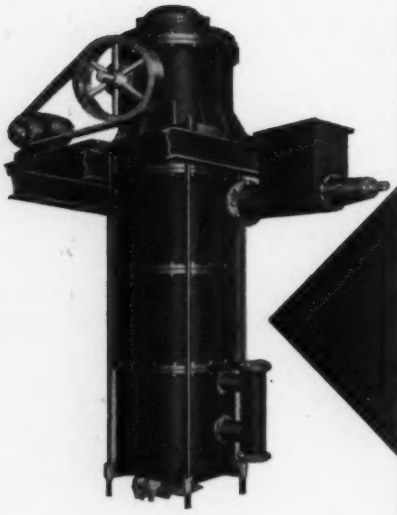
NATIONAL ALUMINATE CORPORATION
6232 W. 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

Nalco

...Serving the Paper Industry through Practical Applied Science

multiple stage extraction system





featuring the J-C ZENITH CONTINUOUS PULP PRESS

J-C Zenith Pulp Presses are available in two sizes — the Zenith "ZM" Press for small capacity and the "ZL" Press for larger production needs. Both models are of J-C vertical design to conserve valuable floor space while increasing plant capacity and efficiency.

For 100% automatic, continuous operation. J-C Zenith Press is adaptable to single or multi-stage continuous counter-current extraction.

Zenith's exclusive Floating Cone* holds a constant, automatically controlled pressure against the pressed pulp as it is discharged, resulting in a uniform finished product.

ZENITH PULP PRESS APPLICATIONS:

Multi-stage or single unit extraction and dewatering

Paper Pulp: undiluted black liquor recovery — de-inking — ultra high density bleaching

Glue Plants: pressing tankage for water removal and grease recovery

Fish Reduction Plants: water and oil from cooked fish wastes and whole fish

Corn Starch Plants: dewatering germ and fiber

Canneries: vegetable and fruit juice extraction, dewatering by-products

Rayon and Cellophane: for the continuous production of alkali-cellulose in rayon, cellophane, C.M.C., etc. by the slurry system

*** patent applied for**

For engineering or performance data, write Dept. PI

A PRODUCT OF

J-C

JACKSON & CHURCH COMPANY, SAGINAW, MICHIGAN

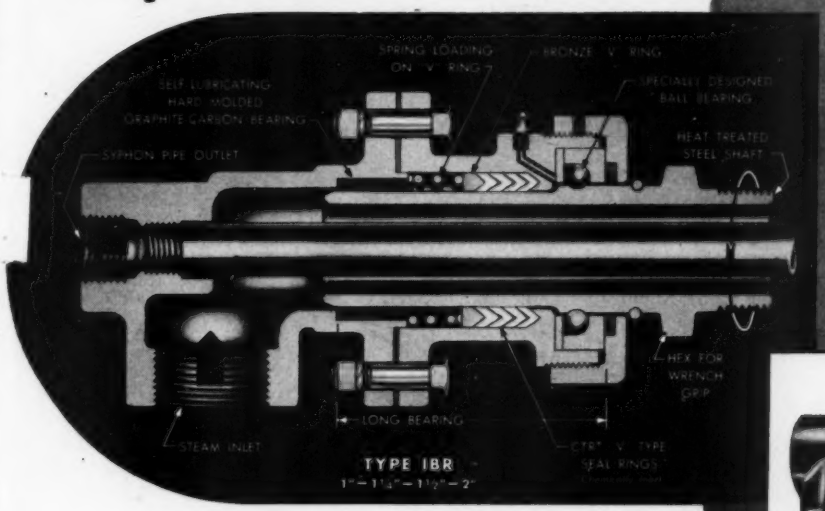
WORK WELL DONE SINCE '81

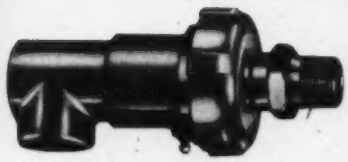
Better Temperature Control

THE IMPROVED

BARCO

REVOLVING JOINT





TYPE IBRSA
½"—¾"

For Paper Machine Dryers, Calenders, Paper Converting Equipment

■ Operating engineers throughout the country are reporting the benefits they receive from Barco's new *improved* Type IBR Revolving Joints. These are benefits that come from the *correctness* of Barco's design. There is minimum increase in torque (friction) under increased steam pressure—thanks to Barco's exclusive "CTR" V-type seal rings and ball bearings. Also note the wide spacing between bearings which holds bearing loads and wear to a minimum.

- **Better Temperature Control where steam is used for heating rolls due to better circulation.**
- **Free-Floating, Low Torque Installations.**
- **Up to 50% Power Savings.**
- **Exclusive "CTR" V-Type Seal Rings—*chemically inert.***
- **Ability to Withstand Vibration and Hard Usage.**
- **Low Maintenance; No Adjusting. Holds seal running or standing.**

Barco builds a complete line of standard revolving joints in sizes ranging from ½" to 2" and special in sizes to 5". Pressures to 250 psi, steam, or 1000 psi, hydraulic. Speeds to 2500 rpm. *Barco Engineers are at your service; ask for recommendations.*

Syphon Style—TYPE IBR. Built for 450°F., steam service to 150 psi, and up to 500 RPM. Hydraulic service to 200 psi, 750 RPM. Higher pressure and speeds under certain conditions.

Single Flow Style—TYPE IBRSA. Similar to Type IBR. Sizes 1" and larger have 2-piece flange connected body.

For information about Barco Revolving Joints, ask for Bulletin 300.

BARCO MANUFACTURING CO.
1826K Winnemac Ave., Chicago 40, Illinois
In Canada: The Holden Co., Ltd.

BARCO

THE ONLY TRULY COMPLETE LINE OF FLEXIBLE BALL, SWIVEL, SWING AND REVOLVING JOINTS

WORLDWIDE SALES AND SERVICE

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

Four new Horton* sulphate digesters were recently installed at the Eastport, Florida plant of the St. Regis Kraft Corporation. These new digesters, which are 12 feet in diameter by 46 feet high, will help to increase production of high grade kraft.

It is the wise pulp and paper mill operator who constantly keeps his eye to the future by laying careful plans to meet the challenges of increased competition. One of the chief ways to get more efficient operation is to take stock of your present equipment and make the necessary improvements.

Look to Chicago Bridge and Iron for dependable service for your next tank and steel plate work needs. For more information about Horton digesters or other steel structures for the pulp and paper industry, write our nearest office. There is no obligation on your part.

Horton* Equipment for the Pulp and Paper Industry

Chip Tanks . . . Blow Tanks
Pulp Tanks . . . Marx Savealls
Elevated Water Tanks
Sulphate and Sulphite Digesters
Accumulators . . . Acid Tanks
CO_2 Tanks . . . Liquor Tanks
Salt Cake Tanks . . . Fuel Oil Tanks
. . . Foam Tanks

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San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
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Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 34 • NUMBER 6 • SEPTEMBER, 1952

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A Manchester Suction Drum Roll will help you!

You will also get: BIGGER PROFITS ★ INCREASED PRODUCTION ★ LONGER FELT LIFE ★ CLEANER FELTS ★ FASTER DRYING RATE ★ BETTER BUYER ACCEPTANCE OF YOUR PRODUCT

We will be glad to supply complete information without cost or obligation.

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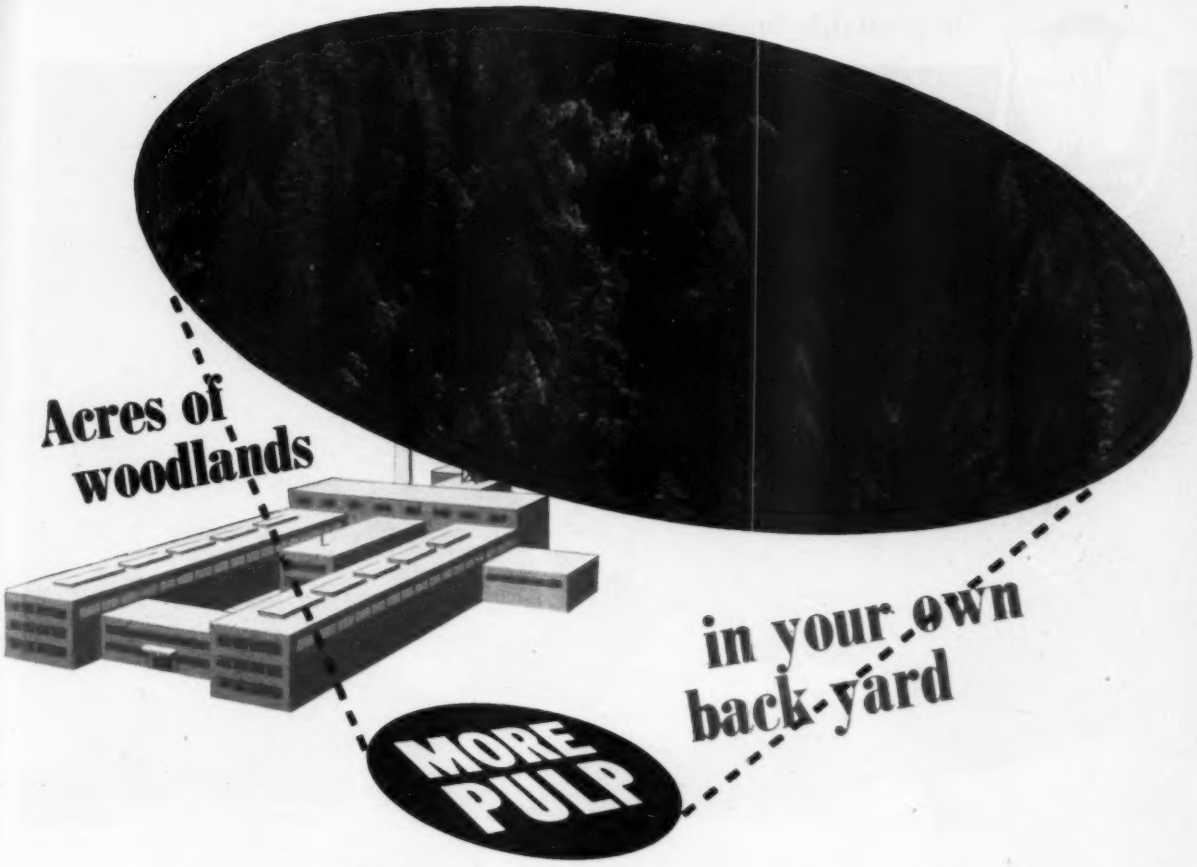
THE MANCHESTER MACHINE COMPANY

1712 CENTRAL AVENUE • MIDDLETOWN, OHIO

SPECIALISTS IN PAPER MILL MACHINERY AND COMPLETE REPAIR SERVICE

A Few Other Manchester Products

Drum Winders • Adjustable Shake Motion • Pope Type Reels • Suction Press Rolls • Size Presses • Paper Machine Drive • Drilled Suction Couch Rolls • Cylinder Moulds • Complete Fourdrinier • Roll Grinding



A Sutherland High Yield System* in your pulp mill is like having many thousands of acres of additional woodlands, only better. For, because of higher pulp yield, you not only increase your potential wood supply, but lower your costs, as well. Here's what High Yield did for a kraft mill in the South:

> **By increasing the pulp yield, Sutherland saved approximately 42,000 cords of wood in 1951. Since annual growth in the area averages about one and one-half cords per acre, the saving equals the yearly product of 27,500 acres of woodlands. To this must be added about 330,000 man-hours of labor.**

Increase your reserves of growing timber . . . while reducing your pulp costs. That's *practical* conservation! Write or wire us.

SUTHERLAND

*U. S. Patent No. 2,591,106

Designed, Engineered, Serviced

continuous beating systems

by SUTHERLAND REFINER CORPORATION

TRENTON 8, N. J.

Dependable Source for Paper-Making Chemicals

Burke E. Cueny, of Butler Paper Co., inspects paper samples.

How product knowledge can help sales

Paper executive points up value of keeping informed on progress in paper making . . . cites use of Wyandotte Purecal M in finish

"I think the use of PURECAL M in paper finish is one of many developments in our industry which every paper salesman should know," says Burke E. Cueny, vice president and general manager of Butler Paper Company, Detroit. "He can't help but profit from such knowledge.

"In my experience selling letterpress and offset printing and now selling paper, I find that the more information I have on how paper is made and finished the more valuable I am to my employers and customers.

"Purecal is a real quality worker in a paper finish. It insures more whiteness and uniformity, takes ink well, and dries quickly. Customers of mine, using paper finished with Purecal, are never hard to resell on the same sheet."

To Paper Makers

Wyandotte PURECAL M is a pigment of highest purity for paper coating. It is ultrafine in quality and particle size, free of grit and other abrasives, readily and easily dispersed in water.

These inherent characteristics insure a uniform, smooth coating of high whiteness and good hiding power.

Act Now

If you are using PURECAL M in your coated papers, see that your sales force is capitalizing on it. If you are not using Purecal, write for complete data. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in Principal Cities.*

*REG. U.S. PAT. OFF.

BULLETIN BOARD

Soda Ash, Caustic:
Supply of these chemicals is currently good; and we are expanding our production facilities, assuring a reliable supply to meet growing demands of the paper industry.

Carbose*:
New Wyandotte Carbose VL is the lowest-viscosity sodium carboxymethylcellulose ever available. It is now being used with outstanding success in calender stock applications. Production of Carbose VL is being expanded to meet increasing demands. Details and samples free.

Kreelon*:
Experience has proved that Kreelon 40, Wyandotte's high-solubility alkylarylsulfonate detergent, in proper formulation, can improve the deinking of waste paper 10-20%. Let our representative call on you. Samples available.

Wyandotte CHEMICALS
FOR PAPER MANUFACTURERS

It's better to get
all your valves
from ONE source
Because when you do this you avoid
— the confusion that accompanies stocking spare parts for valves of several different makes.
— the multiple stocking of valves and parts because different makes are not interchangeable.
— the needless complications that confront your maintenance department in making repairs.
— the chance that some valves are not backed by adequate manufacturer's engineering services.
The Powell Line is so complete that you can get all your valves from one source.
The Wm. Powell Co.
Cincinnati 22, Ohio
Fig. 3003
300-pound Cast
Steel O. S. & Y.
Gate Valve with
flanged ends.
POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1842

HAM FELTZ says:

Down Time is Costly

An idle paper or board machine, like an idle horse, eats its head off. But, unlike a horse, a machine does not need to take time out for rest. Consequently some mills can afford to pay time-and-a-half for over-time labor. They make up the difference by the extra economy of continuous machine operation.

Not so with felts. Felts do get tired before they wear out. A tired felt can't remove as much water as a fresh felt can remove in a given time. When you have to reduce speed or to increase the heat at the driers you know that it is time to replace felts.

Year after year for almost a century, mill superintendents have been well satisfied with Hamilton Felts.

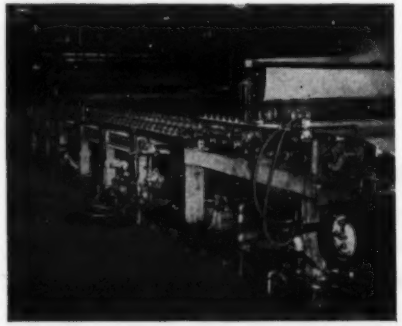
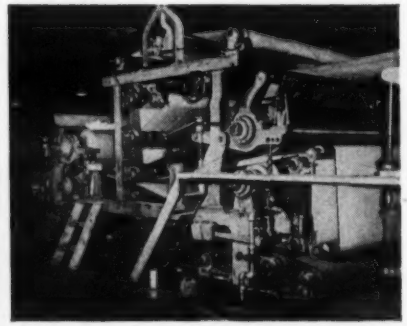
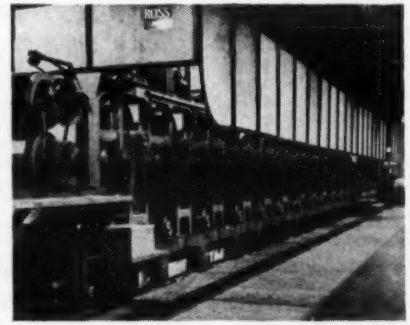
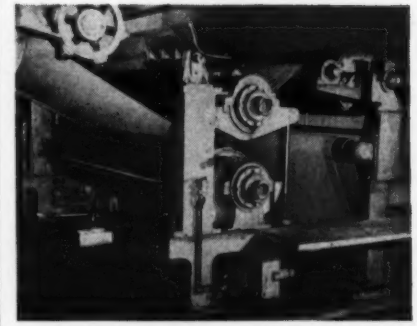
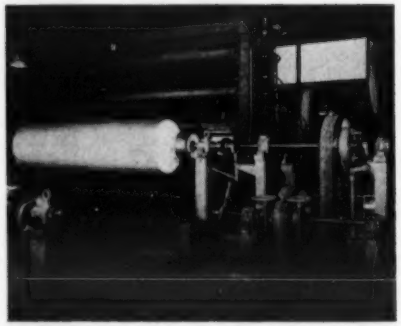
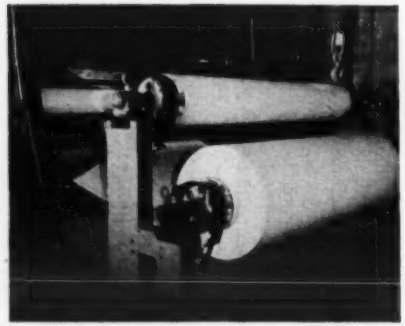
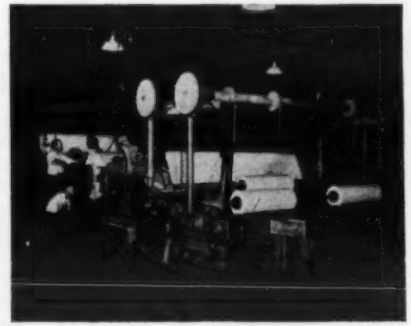
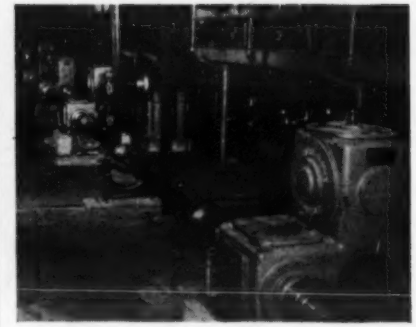
The Hamilton Sales Engineer will be glad to work overtime when you are ready to talk felts.

MIAMI WOOLEN MILLS

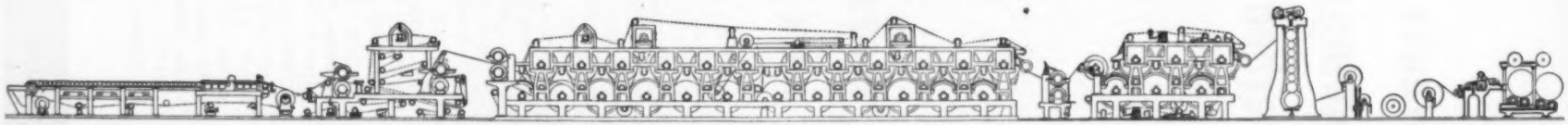
Established 1858

Hamilton Felts

SHULER & BENNINGHOFEN, HAMILTON, OHIO

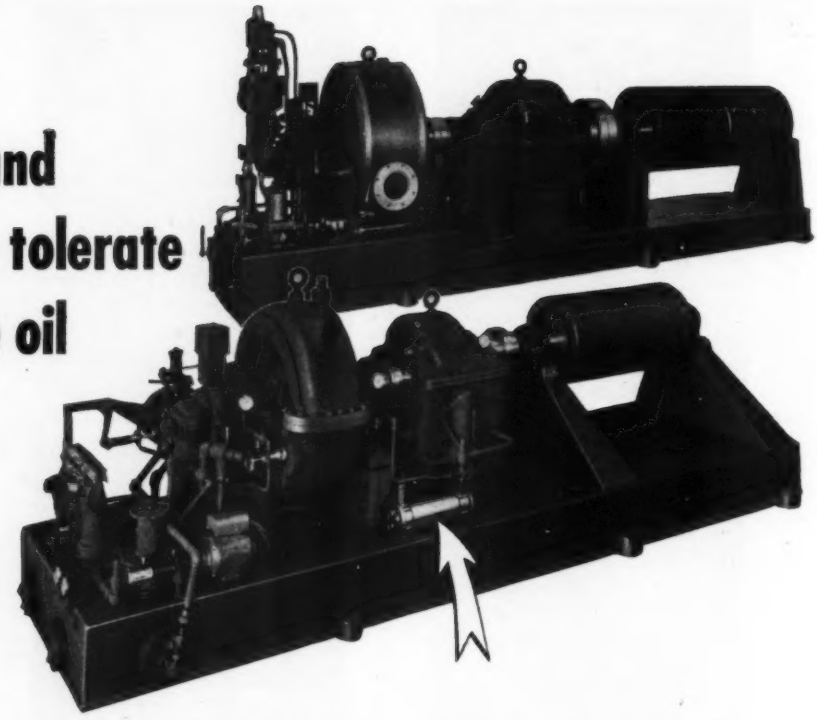









Latest Moore & White Fourdrinier machine with 136" wire operating on specialty grades at Hopper Paper Co., Taylorville, Ill. Above views show various machine sections and Moore & White Syco-type machine drive.



The MOORE & WHITE Company 15TH STREET AND LEHIGH AVENUE PHILADELPHIA 32 PA. • CUSTOM-BUILT MACHINES FOR PAPER MAKERS

because gears and bearings cannot tolerate overheated lube oil



THESE TERRY PAPER MACHINE DRIVES ARE EQUIPPED WITH ROSS EXCHANGERS

Few types of power equipment depend so much on exacting design details as a paper machine drive. Sustained operation at constant speeds, essential to minimizing paper breakage while maintaining uniform stock weight, demands meticulous engineering and proved dependability of every component.

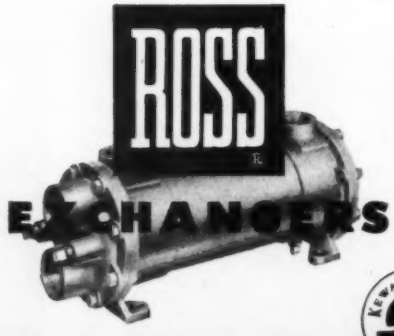
The fact that Ross Exchangers are entrusted with the lube oil cooling assignment on so many paper machine drives . . . on most of the leading makes, therefore speaks for itself. *No exchanger equals it in heat exchange efficiency.*

The Terry Paper Machine Drives, shown here, are typical. Each is equipped with a Ross Type BCF Exchanger as a principal part of its automatic, self-contained, forced feed lubrication system. Vital gears and bearings are thus assured of constant lubrication at required temperature and viscosity. *No danger of overheating here!*

But beyond its reputation for reliability, the compactness of the Ross Type BCF Exchanger is also important to builders of paper machine drives. The Terry Steam Turbine Co., for instance, stresses small space requirements as one of its major design features. How well the space-saving Ross design meets *this* need!

Similarly, Ross Exchangers are vastly preferred for numerous other types of machines serving the paper and pulp industries. Superalenders, large centrifugal pumps, refiners, grinders, rewinders, Diesels. In every instance, machinery builders and users are benefitting from the pre-engineering, complete standardization and mass production of the all-copper and copper alloy Ross Type BCF. *To determine the advantages to your applications, request Bulletin 1.1K5.*

KEWANEE-ROSS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
1430 WEST AVENUE • BUFFALO 13, N. Y.
In Canada, Horton Steel Works, Limited, Fort Erie, Ont.

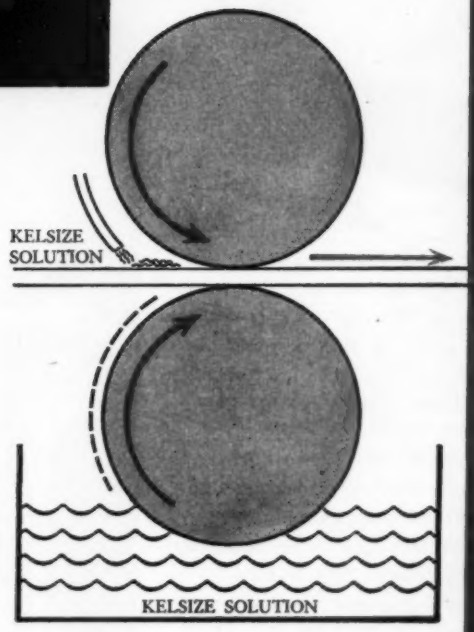


Serving home and industry

AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

KELSIZE and KELGIN

Kelsize and Kelgin are applied as a 0.2% to 3.5% solution from calender stack or size press.



Outstanding advantages

of these hydrophilic sizing agents are:

Uniformly Smooth Finish
Improved Gloss Ink Printing
Greater Wax and Oil Resistance
Uniform Pigment Coatings

For Better Results On

Gloss Ink Paperboard
Frozen Food Containers
Butter Carton Stock
Soap and Cereal Cartons
Milk Bottle Stock
Carbonizing Paper
Pigment Coated Wallboard
Excellent Fuzz Lay-down

Our Technical Service Department will gladly give you detailed information on the advantages of Kelsize and Kelgin in these and similar uses. Write or call our nearest office.

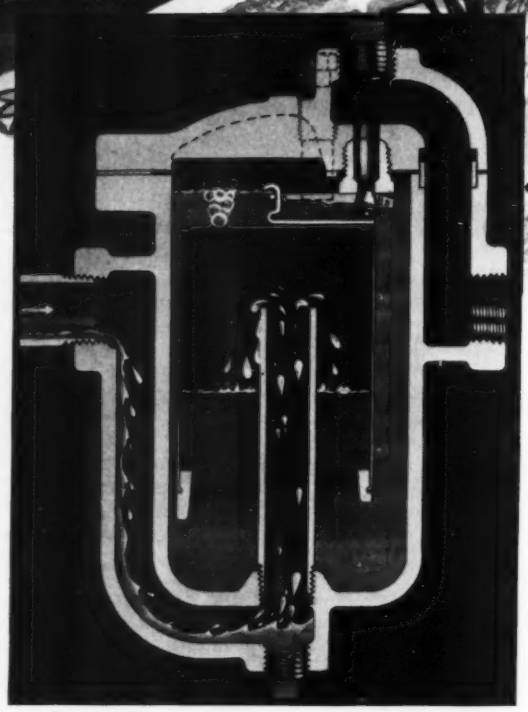
KELSIZE® and KELGIN®

products of KELCO Company

20 N. Wacker Drive, Chicago 6 — 31 Nassau Street, New York 5 — 530 W. Sixth Street, Los Angeles 14

Cable address: KELCOALGIN — New York ®by Kelco Company

Steam Traps & Ground Hogs



THERE IS some reason to doubt that the ground hog comes out of his hole every year on February 2, to look for his shadow in order to find out when spring will arrive.

The story is an entertaining bit of folklore that the newspapers keep alive for the fun of it.

There is a bit of folklore about steam traps for paper machine drainage, too. You hear things like this:

1. There are no traps to handle air fast enough.
2. There are none to handle condensate fast enough.
3. There are none that will last long enough.

This folklore isn't true, either. Armstrong Paper Machine Dryer traps answer all these objections very nicely.

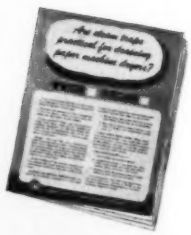
Item 1—air venting—Armstrong paper machine traps have over-sized bucket vents sized specially for each dryer, to vent air FAST.

Item 2—condensate capacity—Armstrong paper machine traps, like all Armstrong traps, discharge condensate as fast as it reaches the trap—at steam temperature. There are traps for the largest as well as the smallest paper machine dryers.

Item 3—trap life—Armstrong paper machine traps have stabilizing tubes which eliminate excessive agitation of the buckets, thereby minimizing wear of parts. All parts are made of corrosion and wear-resistant stainless steel except the valve and seat which are chrome steel, hardened, ground and lapped. The result is *long life with low maintenance.*

Send for Bulletin No. 205

The benefits of Armstrong traps for draining paper machine dryers are explained in more detail in this bulletin. You are welcome to a copy. Write to:



ARMSTRONG MACHINE WORKS

816 Hoffman Street, Three Rivers, Michigan

Inverted Bucket Steam Traps • Paper Machine Moisture Controls and Individual Dryer Temperature Controls

MORDEN *SLUSH-MAKER*

The controllable bar-to-bar action of the "Slush-Maker's" rotor and bed plate (shown enlarged at right) is the answer to rapid, efficient and complete pulping and deflaking of all pulps and paper stocks—even high wet strength.

The circulating action of the rotor blades quickly blends and mixes various pulps along with color, size and other additions to the furnish.

The bar-to-bar action may be set up to give a preliminary beating treatment to the stock or to brush the color and size into the fibers.

The "Slush-Maker" completely prepares the stock for final fiber treatment in "Stock-Makers" or other beating and refining equipment.

We are prepared to run a "Slush-Maker" demonstration for you—let us know your pulping requirements.

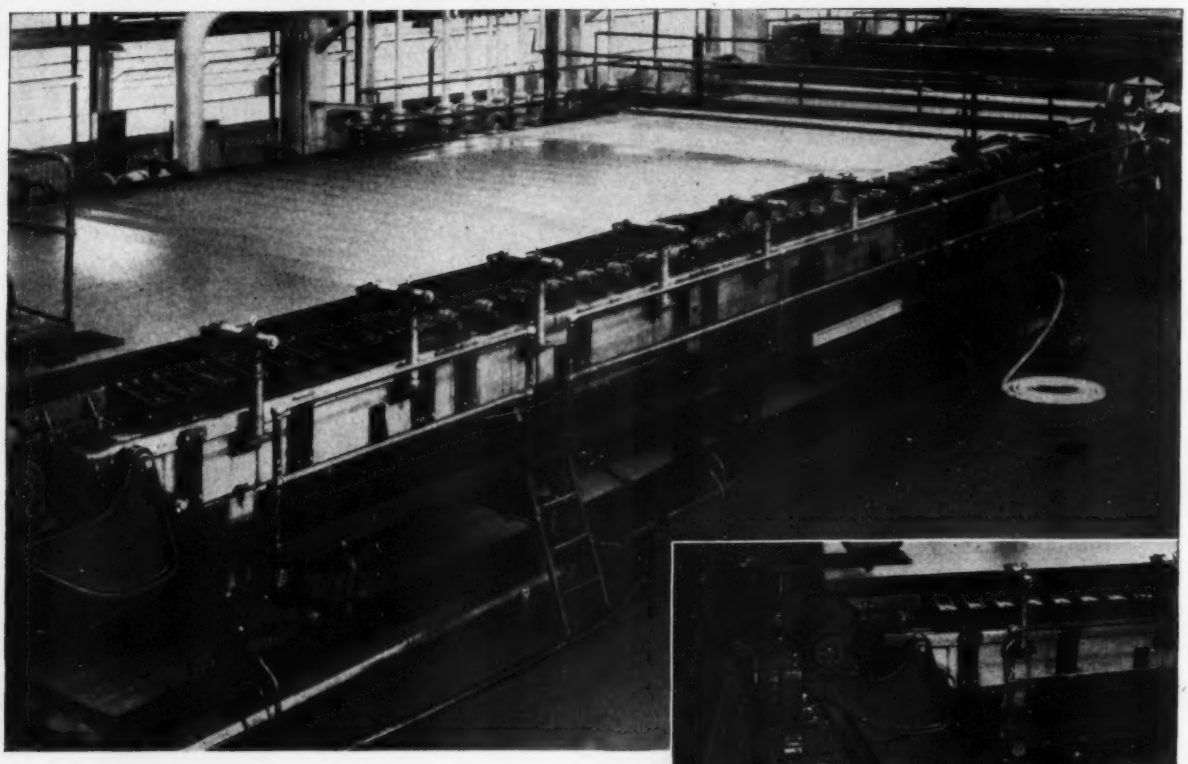
SLUSH-MAKER

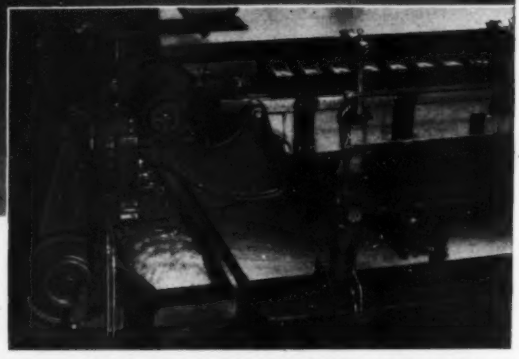
MORDEN

Machines Company

STOCK-MAKER

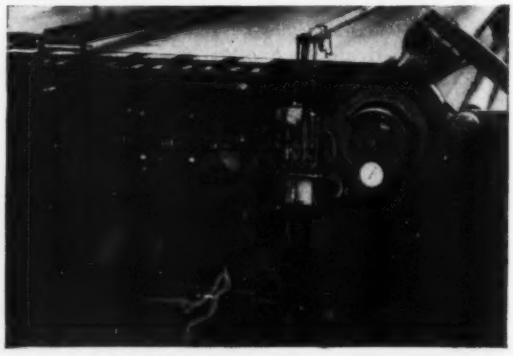
CORBETT BUILDING
PORTLAND 4, OREGON





During wire changing, the only parts of this Fourdrinier that actually move are Breast Roll which swings down, and inside Wire Return Rolls which swing up, hydraulically.

The Suction Couch Roll has become an integral part of the Fourdrinier, another feature that eliminates removable pieces to handle or connections to break during wire changing.



A MODERN FOURDRINIER...

Completely New Design

Each new design and construction feature of this modern Fourdrinier is a contributing factor to the exceptionally fast wire changing for a minimum of non-productive down time. Lower operating costs, easier maintenance and higher production are the direct results.

This modern Fourdrinier, as illustrated here, is 120 feet long from Breast Roll to Suction Couch Roll and carries a 228 inch wire at a speed of 2200 feet per minute.

We invite your inquiries regarding the complete details and the application of the design to your needs or requirements in your modernization program.

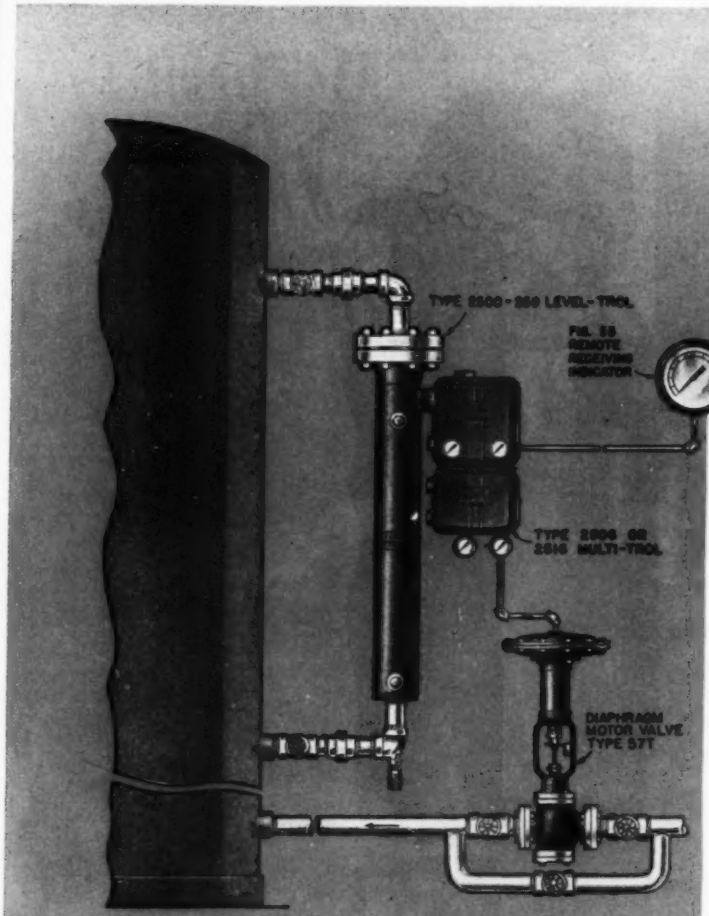
designers and builders of paper making machinery since 1853

BAGLEY & SEWALL

Foreign Representative
Castle and Overton, Inc.
630 Fifth Ave., New York 20, N.Y.

WATERTOWN NEW YORK

Finland Representative
Aktiebolaget Ekstroms Maskinaffar
Helsingfors, Finland

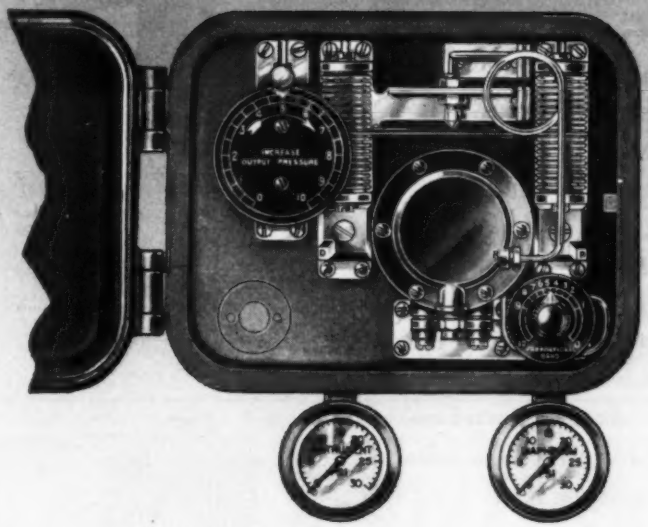


New!

FISHER®

Dual Control LEVEL-TROL

This new Fisher Controller consists of a primary pilot (standard Fisher Series 2500 Level-Trol — used for indicating or controlling level) whose output is transmitted by pneumatic link to secondary pilot — the Multi-Trol.



MULTI-TROL FEATURES

1 — Available with reset (Type 2516) or without reset (Type 2506). (Reset may be added to units originally furnished without it.)

2 — Proportional band adjustment is incorporated into the remote receiver controller with a range of 10% to 200%.

3 — Level control point is adjustable manually in the case by level set adjustment. For remote set — provided with connection for remote air loading.

4 — Pressure balanced type of relay provides intermittent bleed and gives accurate stable control.

5 — Pilot may be changed from a direct acting to a reverse acting unit or vice-versa, thru the use of switch plates.

6 — Pilot may also be changed from proportional action to two position action or vice-versa, by repositioning a switch plate.

Complete information will gladly be sent upon request.

FISHER GOVERNOR COMPANY, MARSHALLTOWN, IOWA

FISHER® LEADS THE INDUSTRY IN RESEARCH FOR BETTER PRESSURE AND LIQUID LEVEL CONTROL

Transportation . . . developed by an industry which has stripped the shackles of time and distance from man and his imagination — giving impetus to paper-making and substance to civilization.

Fourdrinier Wires . . . fundamental to paper-making and brought to new high standards of performance by Appleton Wire Works, Inc., where for 56 years continuous research — directed toward making a better product—has *earned* the acknowledgment that *"Appleton Wires are Good Wires."*

APPLETON WIRE WORKS, INCORPORATED • APPLETON, WISCONSIN

CHEMICAL USERS' GUIDE To General Chemical Products for the Paper Industry

PRODUCT	AVAILABLE FORMS	COMMERCIAL STRENGTH (MIN.)	SHIPPING CONTAINERS	APPLICATIONS
Aluminum Sulfate $Al_2(SO_4)_3 \cdot 14H_2O$ approx. *(Alum)*	Commercial & Iron Free: Lump, Ground Powdered	17.25% Al_2O_3	Bags Bulk Carloads	Precipitation of rosin size and filler; water clarification; manufacture of satin white; pitch control; mordant for dyes.
Aluminum Sulfate $Al_2(SO_4)_3$ + water *(Liquid Alum)*	Liquid	32° Be (total Al_2O_3 7.2%)	Tank Trucks Tank Cars	Same as commercial dry product but lower strength.
Salt Cake Na_2SO_4	White or Grayish Granules	95-99% Na_2SO_4	Bags Bulk Carloads	Used in kraft cooking liquors as the source of Na_2S.
Glauber's Salt, Crystal $Na_2SO_4 \cdot 10H_2O$ *(Sodium Sulfate)*	Colorless Crystals	96% $Na_2SO_4 \cdot 10H_2O$ (42.3% Na_2SO_4)	Bags Barrels Fibre Drums	Substitute for salt cake in kraft cooking liquor.
Glauber's Salt, Anhydrous Na_2SO_4 *(Sodium Sulfate)*	White Granules	99.9% Na_2SO_4	Bags Bulk Carloads	Same as Crystal but stronger product.
Sulfuric Acid H_2SO_4	Liquid	66° (93.19%), 99% 20% oleum and higher strengths	Carboys Steel Drums Tank Trucks Tank Cars	Wire souring; parchmentizing; acid wash in last stage of multi-stage pulp bleaching; neutralizing tall oil soaps; pH adjusting.
Hydrochloric Acid HCl + water *(Muriatic Acid)*	Liquid	18° Be (27.92%) 20° Be (31.45%) 22° Be (35.21%)	Carboys Tank Trucks Tank Cars	Wet strength paper.
Sodium Bisulfite, Anhydrous $Na_2S_2O_5$ *(ABS) (Sodium Metabisulfite)*	Powder	97.5% $Na_2S_2O_5$ (Equiv. 65.5% SO_2)	Bags Fibre Drums	Anti-chlor.
Sodium Silicate $Na_2O \cdot XSiO_2$ + water *(Water Glass)*	Liquid	38°, 41°, 42° Be; special and higher strengths	Steel Drums Tank Cars Tank Trucks	Adhesive for corrugated and solid fibre board; used in coating mixtures to reduce viscosity and in beater sizing to stiffen paper. Aid in bleaching & flocculation.
Chromium Potassium Sulfate $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$ *(Potash Chrome Alum)*	Red Violet Crystals	99.5% $K_2SO_4 \cdot Cr_2(SO_4)_3 \cdot 24H_2O$	Fibre Drums	Used in "save-all" or white water systems.
Aqua Ammonia NH_4OH + water *(Ammonia)*	Colorless Liquid	26° Be (29.4% NH_3)	Carboys Steel Drums Tank Trucks	Used with chlorine to form chloramines for slime control.
Sodium Fluoride	Powder	95% NaF 97% NaF	Multiwall Paper Bags Fibre Drums	Preservative and stabilizer for starch in coating mixtures.
Tetrasodium Pyrophosphate, Anhydrous $Na_4P_2O_7$ *(TSPP) (Pyro)*	White Powder	98% $Na_4P_2O_7$ (Equiv. 52% P_2O_5)	Bags Fibre Drums	Felt washing; pitch dispersion; coating.
Sodium Tripolyphosphate $Na_5P_3O_{10}$ *(Tripoly)*	White Powder	90-95% $Na_5P_3O_{10}$ (Total P_2O_5—56%)	Bags Bulk Carloads	Felt washing; pitch dispersion; coating.
Nitric Acid HNO_3 + water	Liquid	42° Be 67.2% HNO_3	Carboys Drums Tank Trucks	Nitrating pulp; cleaning monel metal.

The products advertised are commercial chemicals having various uses, some of which may be covered by patents, and the user must accept full responsibility for compliance therewith.

BASIC CHEMICALS

FOR AMERICAN INDUSTRY

OTHER PRODUCTS: Sodium Sulfite; Sodium Thiosulfate; Sodium Metasilicate; Trisodium Phosphate; Copper Sulphate; Disodium Phosphate.

FOR THE LABORATORY OR SPECIAL APPLICATIONS: BAKER & ADAMSON REAGENTS and FINE CHEMICALS

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

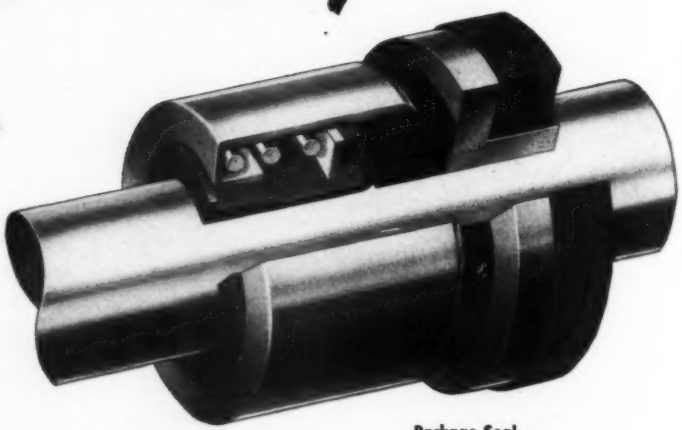
Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte Chicago • Cleveland • Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Providence • St. Louis San Francisco • Seattle • Yakima (Wash.)

In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

Garlock Mechanical Seals Save 3 Ways!

1. **REDUCE LEAKAGE OF COSTLY OR HAZARDOUS LIQUIDS ON ROTATING SHAFTS**
2. **NO WEAR ON SHAFT OR SHAFT SLEEVE**
3. **LONG LIFE WITH LESS PRODUCTION LOSS AND LOWER REPAIR COST**



Package Seal

It is most economical to use Garlock Mechanical Seals whenever *leakless* operation of rotary shafts on pumps or other equipment is required.

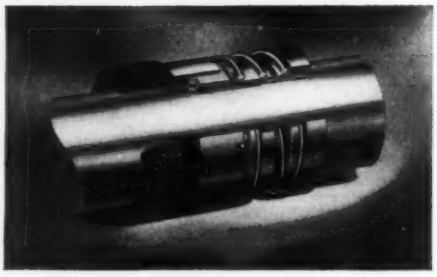
Once the proper Garlock Mechanical Seal has been installed on a rotary shaft you can forget about leakage. A leakless seal is provided by a positive contact between carefully lapped metal-to-carbon or metal-to-metal mating surfaces.

Garlock Mechanical Seals are recommended for use on rotating shafts against practically any liquid including strong acids. All metal parts are available in a variety of corrosion-resistant materials.

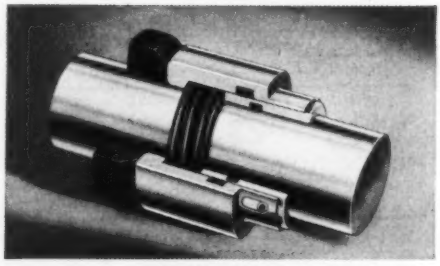
The CHEVRON* Seal, for pressures up to 200 p.s.i., and the "O"-Ring Seal, for pressures up to 1000 p.s.i. and over, are individually engineered for each application.

The Package Seal is a low-cost, production-run seal for pressures up to 150 p.s.i. Package Seals of standard construction (brass case and brass washer) are stocked at the factory, for shafts size 3/8" to 2", advancing by sixteenths, and for shafts size 2" to 3", advancing by eighths.

For complete information write for our Mechanical Seal Booklet or ask your Garlock representative.



CHEVRON* Seal



"O"-Ring Seal

*REGISTERED TRADEMARK

THE GARLOCK PACKING COMPANY
PALMYRA, NEW YORK

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

GARLOCK **PACKINGS, GASKETS, OIL SEALS, MECHANICAL SEALS**

EASILY HANDLES 3000 POUNDS OF BROKE PER HOUR
on an economical 35-40-h.p.

No. 1 E.D. Jones Pulp-Master

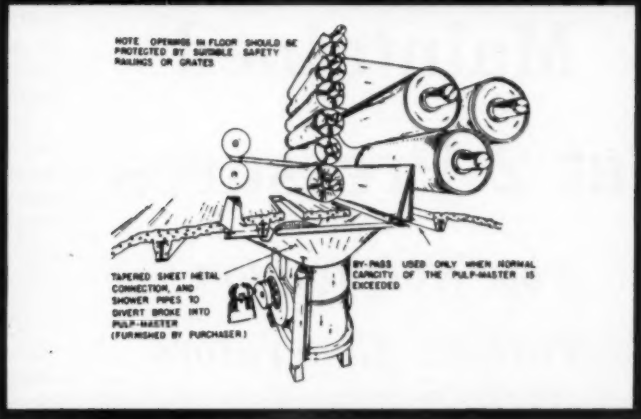
Ideal for installation under your paper machine, the Jones No. 1 Pulp-Master will easily handle 3000 lbs. of broke per hour, extracting completely pulped stock continuously through non-clogging perforated plates. *Slabs?* — sure, slabs up to the full width of your machine can be dropped or thrown in, and are almost instantly disintegrated.

Simple and fool-proof in design and operation, it requires no operators beyond the regular machine crew, and is free from troublesome maintenance problems. Power consumption, an economical 35 to 40 h.p.

Three other sizes of Jones Pulp-Master are available with capacities up to 4000 lbs. at 6½% or even higher densities, for batch or continuous operation.

Illustrated above in stainless steel, the No. 1 Pulp-Master is also available in regular carbon steel or for economical tile tank construction.

Delivered completely assembled, it is readily anchored in position (see suggested plan at right), piped up and connected to driving motor, ready to do a truly amazing job of pulping broke continuously.

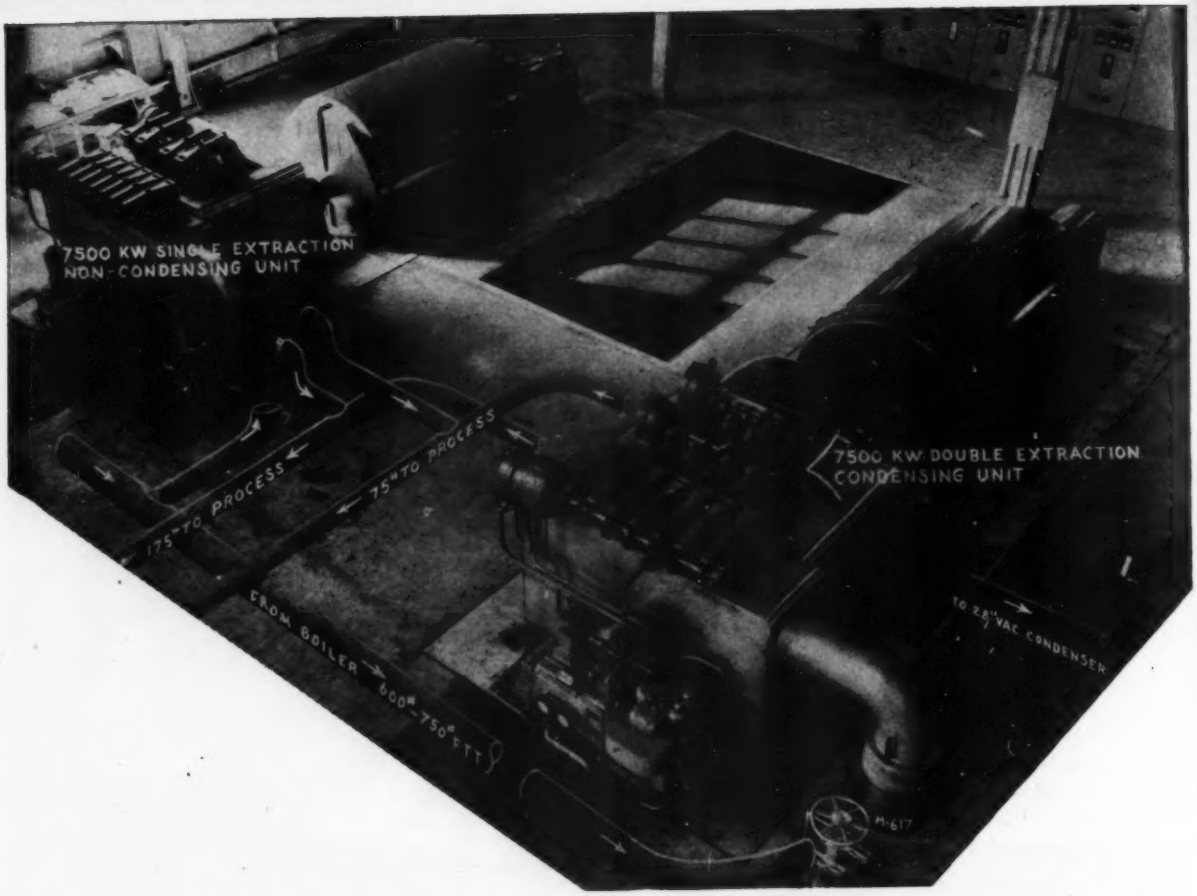

NOTE: OPENINGS IN FLOOR SHOULD BE PROTECTED BY SUITABLE SAFETY RAILINGS OR GRATES
TAPERED SHEET METAL CONNECTION, AND SHOWER PIPES TO DIVERT BROKE INTO PULP-MASTER (FURNISHED BY PURCHASER)
BY-PASS USED ONLY WHEN NORMAL CAPACITY OF THE PULP-MASTER IS EXCEEDED

Ask your Jones representative for full details of the Pulp-Master Line, or write us for Bulletin EDJ-1019 B.

E.D. Jones

E. D. Jones & Sons Company, Pittsfield, Mass.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY


7500 KW SINGLE EXTRACTION NON-CONDENSING UNIT
7500 KW DOUBLE EXTRACTION CONDENSING UNIT
175# TO PROCESS
75# TO PROCESS
FROM BOILER 600°-750° F T T
TO 28" VAC CONDENSER
M-617

Process Steam Maintained at 2 Pressures

by Worthington Turbine Generators

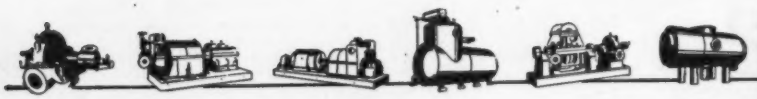
This is how Worthington and a Far West cellulose mill set up the steam supply for utmost efficiency and flexibility.

We combined a non-condensing single automatic extraction unit with a condensing double automatic extraction unit. The 7500-kw units operate in parallel and, in addition to supplying plant power, furnish steam at two pressures for process requirements.

Along with the advantages of efficient operation and low cost and ability to adjust to mill requirements, this mill benefits from the manufacturer's *unit responsibility*. In this case, Worthington also furnished two 470-hp turbines to drive boiler feed pumps, two 452-hp turbines to drive induced-draft fans, two 146-hp turbines to drive forced-draft fans, and one 50-kw turbine-driven exciter set.

If you want proof *there's more worth in Worthington*, write Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Steam Turbine Division, Wellsville, New York.

T.2.6



A GREAT TEAM IN STEAM

WORTHINGTON

Steam Turbine Generators

This crude tool began 17 centuries of paper sizing...

Slowly, laboriously, the Asiatic papermakers of the 8th Century A.D. worked with crude tools such as this . . . sizing the surface of their writing paper to make it impervious to ink. Pouring a thin starch paste over each sheet, they slowly worked it into the paper with this clumsy, wooden, trowel-like tool.

Today's high-speed machines size tons of high grade paper in hours—a far cry from the first hand sizing operations. Staley, serving the paper industry for over 30 years, makes a wide range of highly refined and modified starch and dextrin products that produce outstanding results in modern paper mill operations. If dependability, quality, fair prices and the *plus* of technical assistance are important to *you* . . . get in touch with your material supplier—or write direct, *today*.

A. E. STALEY MFG. CO. • Dept. PI-9, Decatur, Illinois

PIONEERS IN PRODUCTS FROM
Staley
CORN AND SOY BEANS
®

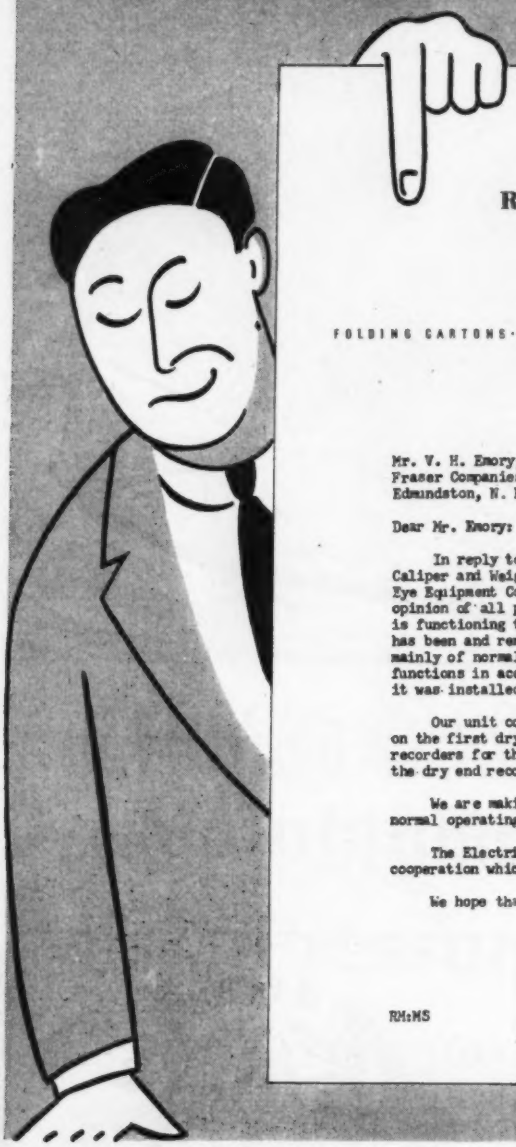
SIZING STARCHES
Staley makes a full range of starches and dextrins for beater, surface or calender sizing.

COATING ADHESIVES
Staley Starches and Dextrins give better results for machine or regular brush coating.

CORRUGATING AND LAMINATING
Choose Staley's finer corrugating starches, special laminating and bag adhesives.

PLASTICIZERS
"Sweetose" and Staley's Corn Syrup are ideal softening agents for glassine paper.

YOU READ IT. WE'RE TOO MODEST TO LOOK



ROBERT GAIR COMPANY, INC.

Gair Cartons Division
Piermont, N.Y.

FOLDING CARTONS · BOXBOARD · FIBRE & CORRUGATED SHIPPING CONTAINERS

April 2nd, 1952.

Mr. V. H. Emory, Mill Manager,
Fraser Companies, Limited,
Edmundston, N. B., Canada.

Dear Mr. Emory:

In reply to your inquiry of March 22nd, 1952, concerning the Hurletron Caliper and Weight Control, installed in our board mill by the Electric Eye Equipment Co., Danville, Illinois, I can say that it is the unanimous opinion of all personnel of this division of our company, that the equipment is functioning to our full satisfaction. Care and maintenance of the unit has been and remains at what we consider an absolute minimum and consists mainly of normal replacement of weak tubes. In our opinion, this equipment functions in accordance with the claims of the manufacturer and does the job it was installed to do.

Our unit consists of four measuring heads, three at the wet end mounted on the first dryer and one at the dry end after the last calender stack. The recorders for the wet end are installed at the wet end of the machine room and the dry end recorder is located in a separate cabinet at the dry end.

We are making all grades of folding boxboard on a cylinder machine at normal operating speeds.

The Electric Eye Equipment Co. has given us that extra service and cooperation which makes for the highest type of inter-company relationship.

We hope that this information will be adequate for your purposes.

Very truly yours,

H. VAN [illegible]
Division Manager

RM:MS

If you want to know more about this equipment that measures thickness clear across the sheet . . . makes corrections in stock flow when a trend has been established . . . provides a continuous, permanent record of caliper at wet and dry ends . . . all automatically . . . then write at once for our bulletin No. 211.

HURLETRON
Automatic
CALIPER and WEIGHT CONTROL

ELECTRIC EYE EQUIPMENT COMPANY 10 WEST FAIRCHILD STREET • DANVILLE, ILLINOIS

Do you have a water problem?

PRESSURE WASHING

patent pending

If water is limited or you're faced with a stream pollution problem, Pressure Washing can help you. For one thing, a three-stage, 300-ton system uses less than 200 g.p.m. And since the pulp is delivered at 35% consistency in a typical system, it is possible to make use of surplus screen water for dilution and to further reduce effluents to the sewer.

Water economy and cleaner streams are just two of the advantages of Pressure Washing. Learn the facts for yourself by writing for complete data.

Systems can be furnished in three, four and five stages to fit individual mill needs.

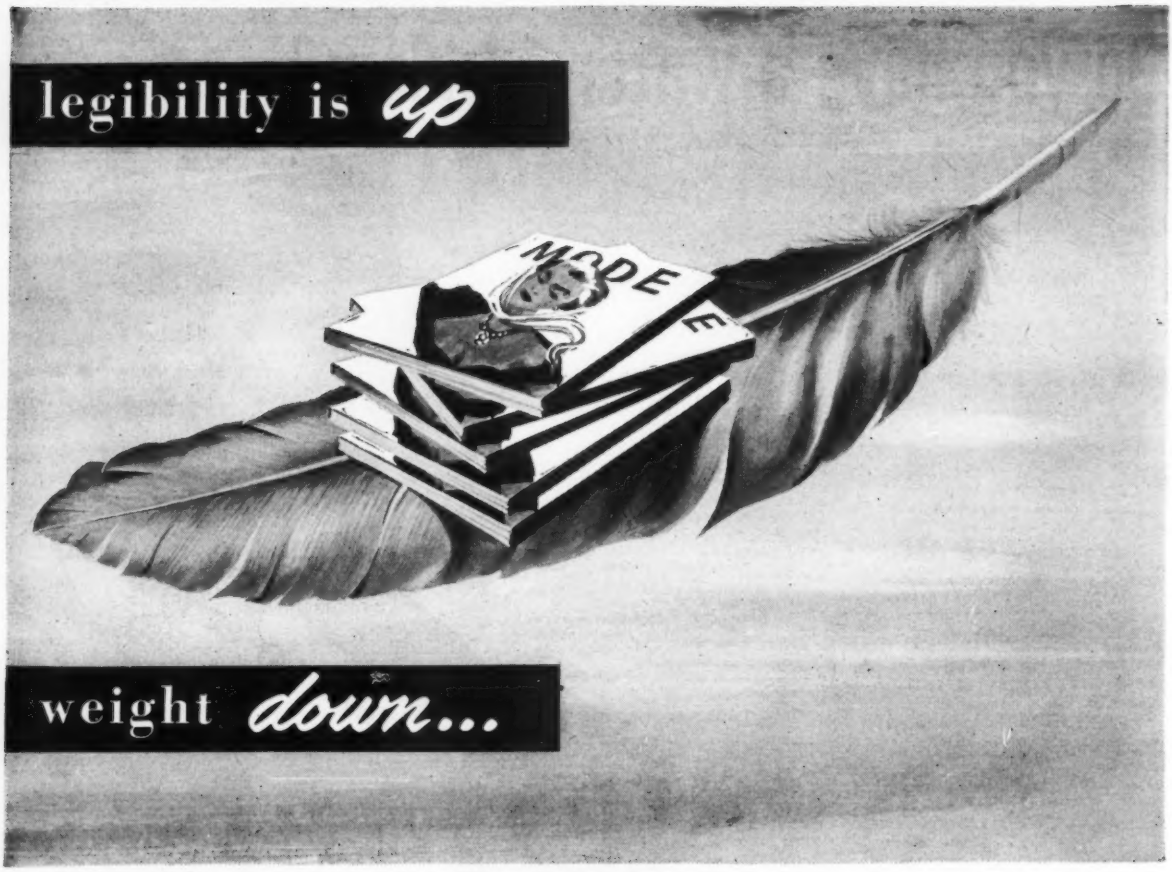
Sales & Service

SUTHERLAND REFINER-CORPORATION

Manufactured by **VALLEY IRON WORKS CO.,** APPLETON, WISCONSIN

Trenton 8, N. J.

Designed & Engineered by **SUTHERLAND, INC.**



with the help of *Titanox Pigments*

Ever-increasing mailing costs continue to expand the demand for lighter weight paper.

Pigmentation with Titanox makes possible the manufacture of these lighter papers without increase in show-through or loss of brightness and opacity. Both TITANOX-AWD, the water dispersible titanium dioxide, and TITANOX-RCHT, the rutile-calcium pigment, produce this desired result—either added directly to the beater or used in the coating.

Results of our many years of research in the TiO_2 pigmentation of light-weight paper may be of help to you. Ask your Titanox representative or write Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

9644

® **TITANOX**

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

PRODUCE MORE WITH YARWAYS...

Is higher production your aim?

Then Yarway is your steam trap. Best steam trap performance requires condensate drainage *plus*—

1. **Air and gas removal.**
2. **Velocity scrubbing of condensate from heat transfer surfaces.**
3. **Keeping highest average temperature in the equipment.**

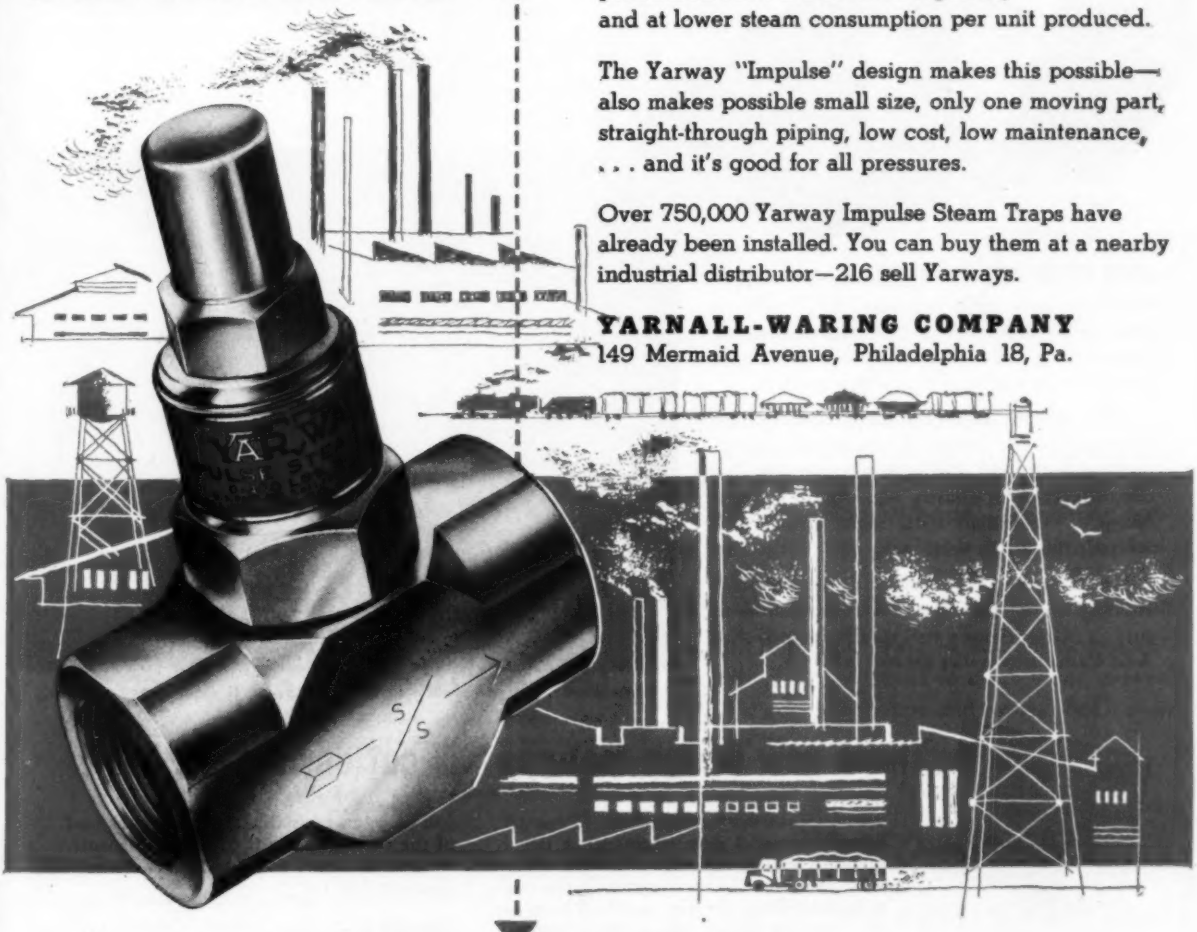
Yarway Impulse Steam Traps do all this, *sending the most premium B.T.U.'s at top temperature into your process or product.*

That's why equipment drained with Yarways gets "hotter, sooner" . . . why better quality and higher production rates are so often reported, and at lower steam consumption per unit produced.

The Yarway "Impulse" design makes this possible—also makes possible small size, only one moving part, straight-through piping, low cost, low maintenance, . . . and it's good for all pressures.

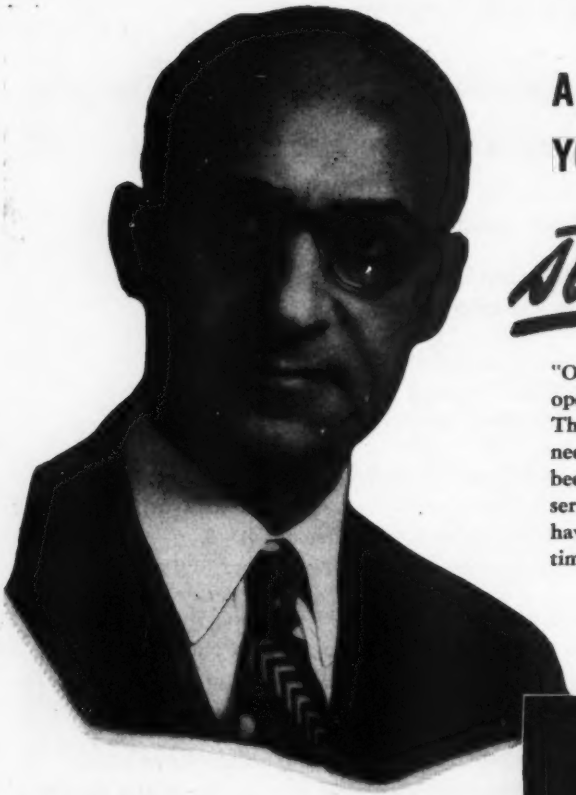
Over 750,000 Yarway Impulse Steam Traps have already been installed. You can buy them at a nearby industrial distributor—216 sell Yarways.

YARNALL-WARING COMPANY
149 Mermaid Avenue, Philadelphia 18, Pa.



FREE OFFER
Don't take our word for it. Test Yarway's production advantages in your own plant, without cost or obligation. Drop us a card. A trial trap will be delivered promptly.

YARWAY the steam trap designed with production in mind



A 30-YEAR USER TELLS WHY YOUR CAMACHINE WINDERS *stay on the job!*

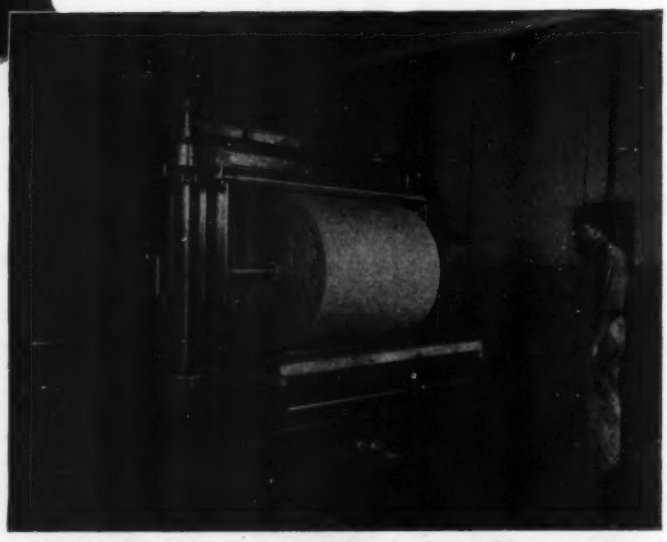
"Our new Camachine is mounted next to a Camachine that I operated about 30 years ago when I started in the paper business. Through the years, that machine and a few of the others have needed new parts to keep our production high. This need has been more than satisfactorily handled by Cameron's efficient service department, a group of well-trained, courteous men who have exercised every effort in our behalf to keep costly down-time to a minimum."

GEORGE B. GOLDMAN, *President*
G. B. Goldman Paper Co., Philadelphia, Pa.

SOME YEARS AGO a large paper mill wanted to know why rolls rewound by Goldman were so far superior, from a technical standpoint, compared to those supplied by the mill. An expert was sent to study the problem.

After several days of careful investigation covering every phase of operation, equipment and method, the expert concluded that the difference in quality was due to a single factor . . . Goldman rolls were Camachine-wound, the mill's were not!

Similar tests have been conducted by other leading users, and always with the same result . . . Camachine's roll quality stands out! And Camachines *stay on the job!*



Camachine Type 10 recently installed at the G. B. Goldman Co. plant.

These new design features will cut down-time, too...

The CAMACHINE COMMANDER (Type 10) features several new engineering developments which virtually eliminate vibration and provide for superior strip control, including: positive toothed belts on the rewind drum drive; ball bearing mounted rewind shafts, fitted to eliminate end play; and equalized drive at each end of the riding roll. For complete information write for Camachine Catalog Supplement 2000-A.

CAMERON MACHINE COMPANY
61 Poplar Street, Brooklyn 2, N. Y.

INSIST ON BETTER SERVICE AND YOU'LL WIND UP WITH *Camachines*®

AA-201

Once through the FULTON ROLL PRESS made the difference in these knots!

69.6% MOISTURE (Before)

Unretouched photo of soggy mass of knots soaked in black liquors, just as they came from the digester. Note how cooking failed to reduce knots.

Independent Testing Laboratory Report Confirms Results of Test Run on Knots for Large Southern Kraft Mill

44.9% MOISTURE (After)

Unretouched photo of same knots after a few moments in the FULTON Roll Press. Note how thoroughly black liquors have been expressed and fibers broken up.

The pictures tell the story. Here is the answer to one of your knottiest mill problems! The FULTON Roll Press does an equally impressive job on bark, tailings and similar mill waste — permitting redigestion, refining or profitable utilization as fuel.

all in ONE LOW-COST, CONTINUOUS operation

The FULTON Roll Press makes costly "batch" methods obsolete—saves so much *labor, power, handling equipment, time* and *money* that it soon pays for itself.

May we Prove It by processing a sample of your material without obligation?

FULTON

FULTON IRON WORKS COMPANY

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1259 Delaware Ave., St. Louis 14, Mo.

Please send full details of FULTON ROLL PRESS

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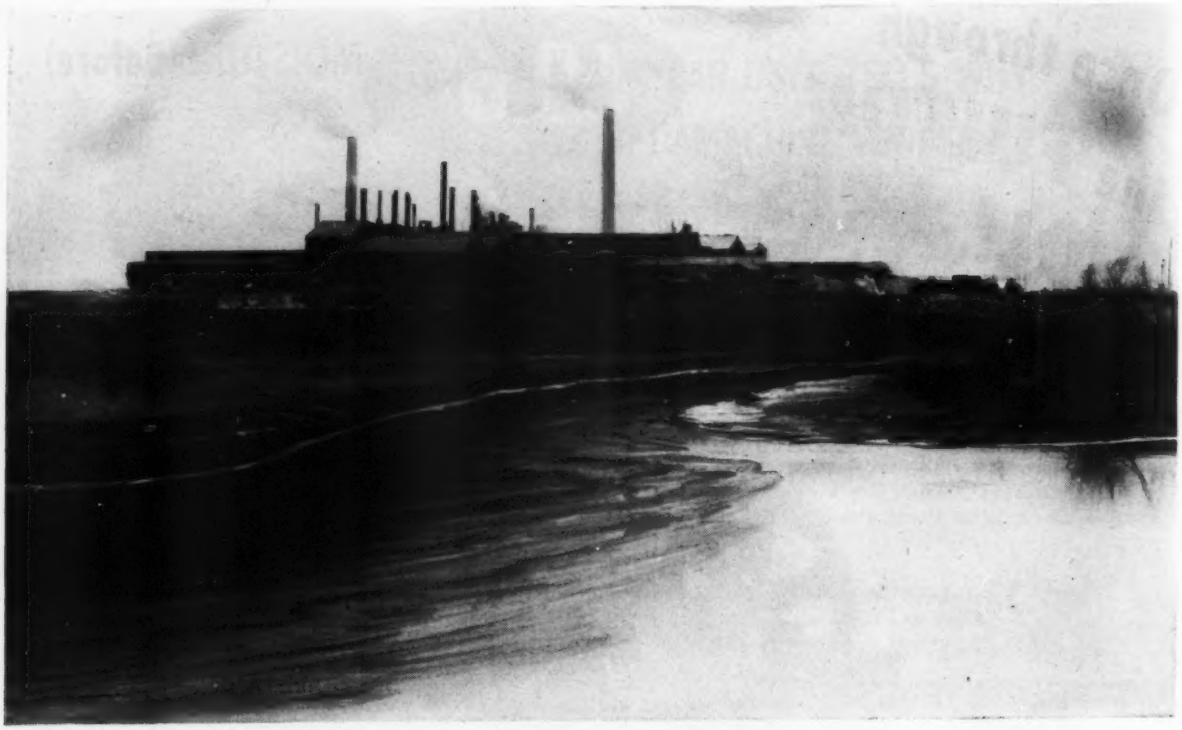
CITY.....ZONE.....STATE.....



WORRIED ABOUT WASTE DISPOSAL?

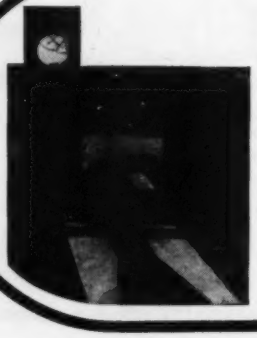
Bailey Meters Help you to Reduce Pollution

● The disposal of industrial wastes without stream pollution calls for careful planning and continuous vigilance.

That's where Bailey Meters and Controls come in. We measure the flow and pH of sewage, sludge, and industrial wastes flowing in open channels or pipe lines. These and other factors, such as levels, rates of chemical feed, and flow of air, may be co-ordinated into a completely automatic system for the treatment and disposal of waste materials.

When you want fast, complete and authoritative answers to the measurement and control aspects of your waste disposal problems, reach for your phone and call your local Bailey Engineer. Offices in all principal industrial centers.

P-24



BAILEY OPEN CHANNEL METERS

These indicating, recording and integrating meters are suitable for measuring industrial wastes, sewage, sludge, corrosive liquids, and irrigation water flowing in all types of open channel primary metering devices, such as Venturi flumes, weirs, or nozzle flumes. Electric or pneumatic telemetering permits location of receivers wherever desired. Ratio of flows and chemical feeds may be controlled automatically.

BAILEY METERS

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1058 IVANHOE ROAD
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Process Controls
TEMPERATURE · FLOW
PRESSURE · LEVEL
GAS ANALYSIS · RATIO

"We get out wood we used to pass up"

SMALL BUT MIGHTY. This International T-6 is small in size only. It helps Sylvester Baker average 11 units of pulpwood daily near Waverly, Georgia.

International T-6 Crawler Opens Up Pulpwood Tracts for Georgia Logger

Around Waverly, Georgia, there's a lot of timber the pulpwood loggers have been passing up for years because it was always considered too difficult to harvest at a profit.

But 30 months ago Sylvester Baker purchased an International T-6 logging tractor.

"Now I get out wood I never tried to work before," he says. *"I like this little tractor and my neighbors like theirs because they work hard, get out more units and hold up better than anything else in the woods."*

See the entire line of fast-working, low-cost International logging tractors for yourself. Let your International Industrial Distributor put International "Power that Pays" on your jobs and you'll profit both in increased production and by lower costs.

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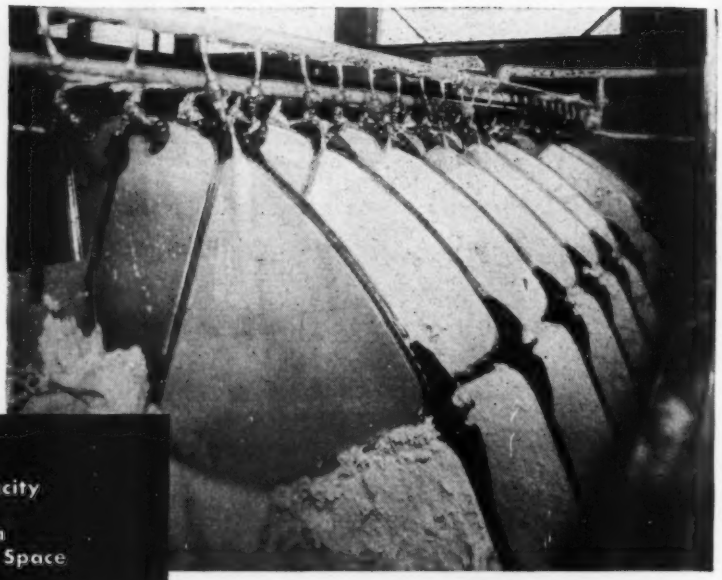
POWER THAT PAYS

SEE YOU AT THE POLLS!

AMERICAN

Disc-Type SAVEALL

- ✓ High over-all Capacity
- ✓ Greater Filter Area per sq. ft. of Floor Space
- ✓ The Ideal Unit for Stepped-up Production



American Disc-Type Saveall recently installed in the Chester, Pa., mill of the Scott Paper Company. Note the water jets peeling off the sheet from individual sectors.

Looking into the future, many paper mills are likely to be confronted with a "space" problem. How about your mill? Are you planning to

a...speed up your paper machines

b...install additional or larger machines

c...operate with greater tonnages of slower stock

d...reduce stock losses

To carry out any one of these plans will involve handling greater volumes of white water which may be beyond the capacity of the largest single drum type Saveall. If floor space is no problem, you can make your choice between the Oliver Drum Type Saveall and the American Disc-Type Saveall. BUT, if extra floor space is either non-existent or set aside for other purposes, look into the merits of the American Saveall.

The largest American can provide a filtering area approximately three times that of the largest Oliver drum type unit yet requires only approximately the same floor area. It has exceptionally high dewatering efficiency. It will give you the highest capacity for a limited floor area. It provides greatest flexibility in filtering area.

An Oliver United Engineer, well experienced in Saveall problems, will be glad to discuss the American Filter in relation to your limited floor space problem.

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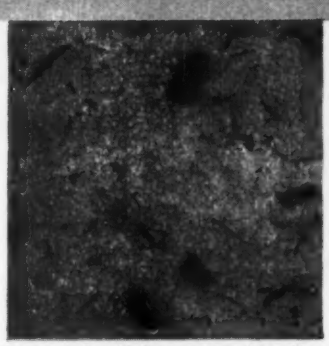
There is only one BEST!

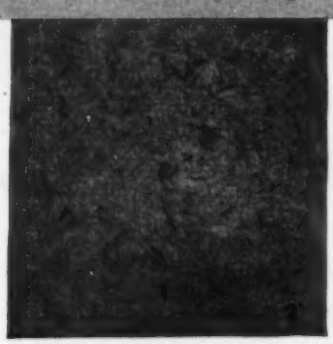
CURLATOR is the ONLY Mechanical Device that will produce from fine screen rejects

- ✓ A CLEANER PULP
- ✓ OF INCREASED YIELD
- ✓ WITH INCREASED TEARING STRENGTH
- ✓ WITHOUT AFFECTING FIBER LENGTH

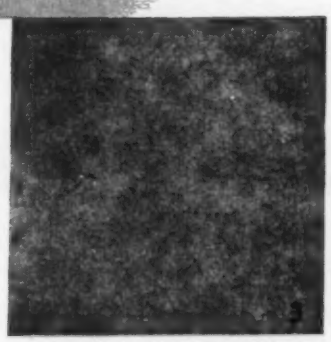
SEE THE DIFFERENCE... These unretouched photographs are actual size.



Paper made with fine screen rejects. Note dirt, shives and large fiber bundles.



Paper made with rescreened rejects. Only the largest particles, 8% of the rejects, are removed. Note the large number of shives which passed through the screen.



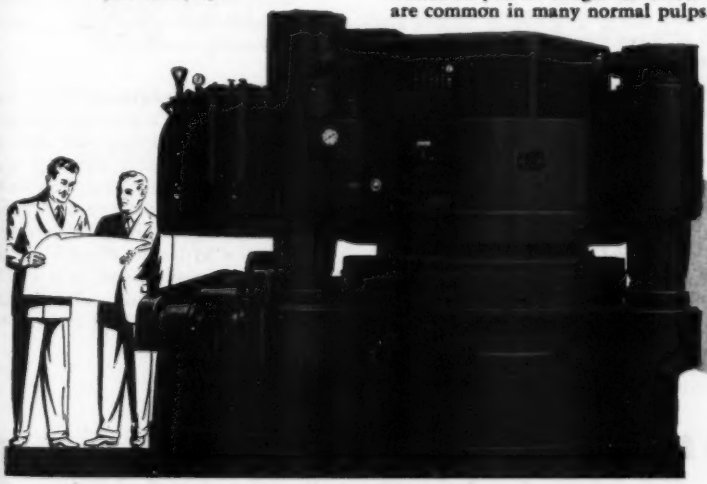
Paper made with screened, Curlated rejects. 99.4% of the fine screen rejects are in this sheet. Note improvement in cleanliness as a result of Curlation.

Write for more detailed information. See the results obtained from your own pulp.

Actual mill operation proves Curlation eliminates shives and separates the individual fiber bundles, as well as reducing the sizes of dirt particles. This permits a large portion of the dirt to be removed during washing and thickening operations.

Curlation increases yield by converting shives and fiber bundles into No. 1 pulp. With Curlation you no longer have No. 2 pulp and fine screen rejects. Increased yields of 5% are common in many normal pulps.

Curlation imparts a permanent bend and twist to fibers thereby imparting higher tearing strength to paper made from Curlated pulp. Sheet No. 3 has 60% higher tearing strength than sheet No. 2. Curlator patented action rolls fiber and fiber bundles under pressure without reducing fiber length. Curlation does not cut the fibers.



CURLATOR† *Corporation*
EAST ROCHESTER, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.

A century of achievement

Studebaker's big, modern South Bend plant symbolizes the century of growth and achievement which have earned for this company an enviable reputation for high quality products and world-wide recognition as America's fourth largest manufacturer of automobiles.

How Standard's lubrication service works for Studebaker

● Look almost anywhere in Studebaker's vast plant at South Bend, Indiana, and you'll see Standard's lubrication service at work.

In one of the many operating departments, the chances are you'll find the Standard lubrication specialist who serves Studebaker. He is assigned to the South Bend area and is close-at-hand to give Studebaker the lubrication engineering assistance they need when they need it.

Almost any day at Studebaker's, you'll see a Standard tank wagon or truck delivering the petroleum products that help keep production rolling. Because these deliveries are made from a nearby Standard warehouse, they are prompt and reliable. Most of the petroleum products used in the Studebaker plant are stocked in this warehouse and are immediately available.

All along Studebaker's assembly and production lines, you'll find Standard Oil products at work. From one of the most complete lines of fuels and lubricants on the market, Studebaker has been able to select the petroleum products that exactly fit its needs.

All of these benefits—expert engineering service, fast and reliable deliveries, a complete line of high quality products—add up to one of the reasons why Studebaker has been a Standard Oil customer for over 50 years. Make Studebaker's experience the basis for putting Standard's lubrication service to work for you. Just phone your local Standard Oil (Ind.) office and ask to have the Standard Oil lubrication specialist in your area call on you.

What's YOUR problem?

Russ Jenkins (left), lubrication specialist from Standard's South Bend office, and Studebaker's Paul Izdepski work closely together to get best results from Standard's fuels and lubricants.

Wherever your plant is situated in the Midwest, there is a Standard lubrication specialist close-at-hand who will work hand-in-hand with you on lubrication problems. Right in your neighborhood, too, you'll find a Standard office and warehouse. It makes immediately available to you a reliable supply of petroleum products. Phone your local Standard office soon, and find how you can profit through Standard's unique industrial lubrication service.

STANOBAR Grease is used throughout the Studebaker plant for lubrication of bearings in electric motors and oil pumps. Its high stability enables it to provide effective lubrication under a wide variety of operating conditions.

STANWAY Industrial Oil. In many of Studebaker's grinding machines, STANWAY Industrial Oil No. 30H answers a special need by serving both as a hydraulic oil and as a lubricant for ways and guides. The high stability necessary in a hydraulic oil and the oiliness needed in a way lubricant are uniquely combined in STANWAY.

STANDARD OIL COMPANY STANDARD *(Indiana)*

ENCLOSED DRYER DRIVE with gear nips "running in oil" makes possible cleaner, quieter operation at higher speeds. While looking at dryer framework ready to be shipped to a mill on the West Coast, "Bud" Hammill (*left*), E. J. Justus and Sterling Skinner discuss Beloit design features which provide for continuous lubrication and simplified removal of dryer bearings.—*Beloit Iron Works, Beloit, Wisconsin.*

BELOIT

PAPER MACHINERY

WHEN YOU BUY BELOIT... YOU BUY MORE THAN A MACHINE!

Merfenel 51*

*PACKED IN ONE AND TWO OUNCE ENVELOPES

A new Product

FOR
SLIME CONTROL
•
MOLD PROOFING
•
PRESERVATION OF
STARCHES AND PROTEINS

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.

The Paper Industry

September 1952

Just to say "hello"

With the assumption of my duties as editorial director of The PAPER INDUSTRY, I first should like to acknowledge a feeling of great satisfaction that arises from the knowledge of being directly associated with one of the most progressive industries on the North American continent, and of the many opportunities this will give me to establish personal contact with the men who have brought the pulp and paper industry to its present position of eminence.

The pulp and paper industry has gone a long way from the primitive industrial installations that turned out the first sheets of newsprint and writing paper, to the 1,030 modern mills in the U.S. currently supplying products used in more than 1,000 different applications. Needless to say, the growth of this industry has contributed immeasurably to the attainment of the world's highest standard of living enjoyed by the people on the North American continent, as reflected by the present 382 lb. per capita consumption of paper and paper products. Moreover, there is no doubt that through the ingenuity of our research chemists and engineers, new products will be recovered from the paper making materials and numerous additional applications will be found for such products.

The primary aim of this publication medium is to serve the pulp and paper manufacturing industry to the utmost of its capacity. As an independent publication medium The PAPER INDUSTRY can perform this task in an unbiased way and to the best advantage of the whole industry. Our function is to report and describe important new developments, disseminate and interpret technical information, and promote a maximum spirit of unity and goodwill between the individual units of this industry.

In these years of uncertainty of world-peace when people are inclined to succumb to a feeling of indifference and to gamble lightly with our most important heritage—western civilization—when forces are being marshaled against us to destroy our accepted standard of social and moral values, we cannot afford to lose sight of the all-importance of unity and active co-operation in any endeavor that will strengthen the free world—be it in the productive, political, or military fields.

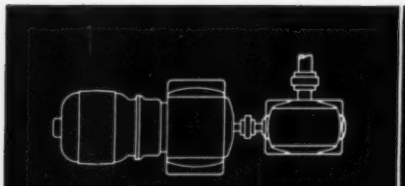
While we agree with many cynics that western civilization is by no means perfect, it cannot be denied that this civilization has somehow managed to forge into its character such qualities as the concept of the dignity of man, the freedom of expression, and the freedom of labor. These are acquisitions free men have come to regard as inviolate, acquisitions that do not lend themselves to compromise.

Through this publication medium we shall, in addition to concentrating on the manufacturing and technical aspects of the industry, make a special effort to develop that spirit of unity and goodwill in a free industry operated by free men.

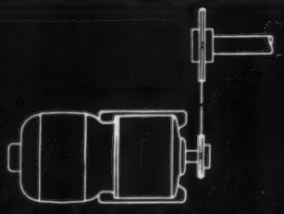
To aid us in our endeavor to efficiently serve the industry we ask only for the co-operation of the industry. We in turn are prepared to earn and retain the confidence upon which such co-operation must be based.

A. W. J. DYCK

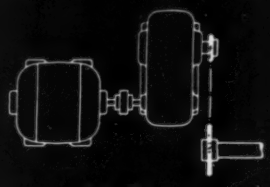
Is your speed reduction problem in this picture?



High-ratio reduction and right-angle takeoff

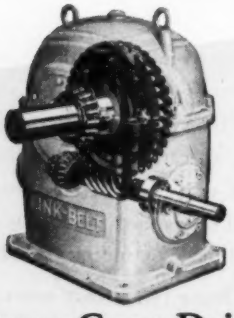


Restricted Space for mounting



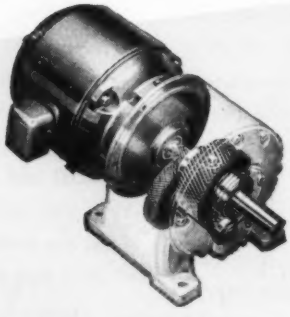
High hp with parallel takeoff

If it is, LINK-BELT has the right reducer for your requirements



Worm Gear Drive

Reduction ratios: 3.1:1 to 8000:1. Torque: 1400 to 123,000 in. lbs. Output shaft rpm: 0.22 to 564. Drawing shows motorized P.I.V. variable speed and worm gear drives direct-coupled.



Gearmotor

Reduction ratios: 6.2:1 to 292:1. Hp range: 1 to 30. Output shaft rpm: 6 to 280. Drawing at top of page shows gearmotor with roller chain drive.

Herringbone Gear Drive

Reduction ratios: 2.84:1 to 318:1. Hp range: ½ to 1000. Output shaft rpm: 2 to 600. Drawing at top of page shows motor with herringbone gear drive and roller chain drive.

Yes, LINK-BELT builds all 3

HELICAL, Herringbone or Worm gear drive — Link-Belt builds them all. And all are made in the widest range of hp ratings and reduction ratios. Truly a specific drive for every reduction problem.

All of this enables the Link-Belt power transmission engineer to recommend the *one* drive best suited to your requirements. And you can be equally sure that every Link-Belt drive is precision engineered for quiet, economical, long-life service.

Call the Link-Belt office near you for engineering information on any or all of these enclosed gear drives. Send for catalogs.

LINK-BELT

ENCLOSED GEAR DRIVES

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, Factory Branch Stores and Distributors in Principal Cities. 12,881

The Paper Industry Current Comment

Business conditions . . . labor . . . forestry

A definite upturn in the paper industry, which began in the second quarter, now seems to be well under way. Demand is strengthening, and the higher prices in the wastepaper market show that in the board field the early slump is being overcome. None of the mills, either paper or board, will admit having too many orders, but the general tone indicates a steady improvement through the rest of the third quarter and presumably the last quarter.

This tendency is shown by paper mill income reports which in many cases show a material gain over net income for the first three months, even though the return does not equal that of last year. Increased sales as compared with last year are shown in many cases, based on dollar volume, but with high taxes the government has taken a huge slice of the earnings.

After steel, John L. Lewis

Labor factors are an important phase of the 1952 situation. The steel strike has curtailed output in industries dependent on this material, and the shortage will continue well into 1953. It appears that the steel workers' union heads have taken a leaf out of John L. Lewis' book by creating shortages of materials as a means of forcing wage increases. Lewis is already embarked on what may be a program of reducing coal inventories by a series of holidays in memory of deaths in the ranks of the employed. When there are large inventories the employers can wait out the results of a strike without the impact of enforced unemployment in industries dependent on fuel supplies. In the Lewis book, this can be met by cutting inventories down to zero before starting wage talks.

The steel strike settlement includes provision for a reconsideration of wage problems next summer, though the agreement was nominally for a two year period. By next June the consumers of steel will still have been unable to set up inventories, so the steel union will be in the bargaining position for which Lewis set the pattern.

While the paper industry has been notably free from strikes, the only serious work stoppage having ended after a year of idleness at the Whippany paperboard mills, a strike of wire-weavers is threatening to force a partial shut down of some mills for lack of fourdrinier and cylinder wires for their machines. The situation has become so serious that the National Production Authority has asked for a census-like survey of the wire situation in the industry in the hope of finding some way of utilization of any wires which may be available from supplies on hand in non-struck plants. The wire manufacturers association is trying to relieve the wire famine wherever it can assist in providing emergency equipment.

The public pays

While the public has felt the shortage of commodities in short supply for lack of steel, it seems to have escaped notice that the cost of the strike is being borne by the public, not by the steel companies. The government is losing hundreds of millions of dollars through idleness in the mills which are not earning taxable income by continued operation. A report from Inland Steel Corp., for instance, shows that its payment of normal and surplus profit taxes to the government will drop nearly thirty million dollars for the first half of the year. As Inland is only seventh in importance in the steel industry, the total loss of revenue to the government will rise into huge figures. This deficit means either early higher taxes on the public or a larger government deficit which must be met some time in the future. Increased taxes to pay the higher wages of the steel employes and other striking unions are inevitable sooner or later. The lost earnings of the steel mill employes will cut their own income tax payments to zero for the year, and the rest of the country must pay the bill.

Scandinavian pulp

The reduced paper production in the early months of the year is having its repercussions on the Scandinavian pulp industry. The Finnish Cellulose Association announced a two-month suspension of operations in all the mills of its members to prevent too great a build-up of stocks of pulp and to conform to the drop in demand, this suspension dating from early July. Finnish stocks of chemical pulp on June 1 totaled about 200,000 tons, as compared with less than half that total on June 1, 1951.

In Norway, the pulp and paper industry has gone to the courts to seek the abolition of the export taxes on chemical and mechanical pulp.

In Sweden the larger producers of pulp have lengthened the usual vacation periods to avoid excessive stocks. Mill stocks of pulp totaled 233,100 metric tons the end of May and 156,200 tons the end of April. Exports in May totaled only 113,548 tons, as compared with 220,115 tons for the same month a year ago.

Good investment

The growing appreciation of the importance and stability of the American paper industry in the minds of investors is shown by a survey of private placement financing by an authoritative New York publisher. This survey shows that 15 paper and pulp manufacturers and six converters obtained $144,516,000 from life insurance companies and other long-term lending institutions during 1951. In addition, $4,850,000 was placed by three paperboard manufacturers. This increased financing does not include increases of capital through special bond or stock issues to stock holders and the general public.

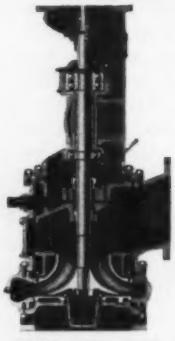
Forestry

A mammoth survey of the nation's resources by the President's Material

You save space with this vertical Goulds STOCK PUMP

Where space is at a premium, you'll find the Goulds Fig. 3115 the ideal pump for paper stock transfer. Because of its vertical design, it requires a minimum amount of floor space.

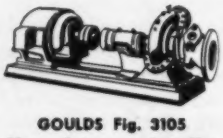
Simple, durable construction assures long service life and easy maintenance. Its readily accessible rotating element can easily be removed without disturbing suction or discharge connections. Large, direct passages permit free flow of heavy stock—eliminate air-binding. Ample flushing and drain connections, both in casing volute and in base, provide easy cleaning. This pump is available with capacities up to 2000 G.P.M. Heads up to 180 ft. Complete information is contained in Bulletin 723.2. Send for it today.



GOULDS Fig. 3115

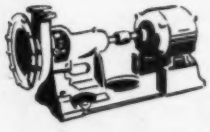
Backwall ejector vanes on impeller prevent binding of stock behind the impeller . . . also give hydraulic thrust balance.

Other Dependable GOULDS Pumps for the Paper Industry



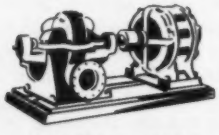
GOULDS Fig. 3105

Heavy duty, open impeller horizontal centrifugal pumps designed for handling paper stocks. Capacities up to 4000 G.P.M. Heads up to 220 ft. Send for Bulletin 723.1.



GOULDS Fig. 3705

Stainless steel pumps for handling acid and alkaline liquors. Capacities up to 600 G.P.M. Heads up to 160 ft.



GOULDS Fig. 3450

These double-suction, single-stage Goulds centrifugals will handle up to 15,000 G.P.M. Heads up to 500 ft. Ask for Bulletin 721.2.

MEMBER

Goulds PUMPS INC.

Seneca Falls New York

Policy Commission devotes a long chapter to "Making the Most of Timber Resources." An effort will be made by all forest-using industries to reach an agreement on the course to be followed in supporting or objecting to such legislative action as may result from this survey, commonly known as the "Paley Report" from the name of the chairman of the Commission. In general, the recommendations include materially increased government appropriations for various phases of the over-all forestry problem. The report gives due credit to the operations of the paper industry in developing better forestry utilization and protection, saying that most privately owned timber lands are being relatively well managed. Closer control of destructive cutting is advised. What action the forest-using industries will take on the various phases of the analysis remains to be determined at forthcoming conferences following intensive study by all such industries of the details of the report.

The many various engineers who have been working on the utilization of bagasse for papermaking have been invited to assist in studies to be made by the National Bureau of Standards. Owners of all known processes have been invited and most of them have accepted the offer of the Bureau to participate in the tests of a ton of Louisiana bagasse for papermaking qualities. In other studies of this problem newspaper executives have been invited to join in seeking means for the best use of this raw materiail.

The President has taken the unusual step of overriding recommendations of the United States Tariff Commission for the increase of duties on imported garlic and Swiss watches. The Commission found that domestic industry was suffering sufficient injury from such imports to justify the use of the escape clauses of Reciprocal Trade Agreements to combat such injury. Despite the recommendations of his technical advisory Commission, however, the President held that the injury reported by the Commission did not justify restoration of earlier duties on these commodities, particularly in view of the possible adverse effect of such action on the United States export trade. Congress set up procedures to protect domestic industry against undue injury from foreign competition, and the President's action may result in more restrictive action at the next session of Congress to curtail the President's power to keep this country on the road toward ultimate free trade. The professed intent of Reciprocal Trade Agreements is to expand foreign trade, but when domestic wage increases have stepped up the cost of American products it is not surprising that foreign buyers cannot afford to pay the

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Brown Paper Mill Company
Brunswick Pulp & Paper Co.
Calcasieu Paper Company
Camp Manufacturing Company
Canada Paper Company
Cellulosa Koncern (Sweden)
Champion Paper & Fibre Co. *(2 Plants)*
Chesapeake Corporation
Companhia Portuguesa de Celulose (Portugal)
Consolidated Paper Company
Container Corporation of America
Continental Can Company
Cressett Paper Mills Ltd.
Crown Willamette Paper Co.
Dryden Paper Company
Enso-Gutzeit Oy (Finland) *(2 Plants)*
Fibre Board Products Corp.
Frazer Company, Ltd.
Gaylord Container Corp.
Gulf States Paper Company
Halifax Paper Company
Hollingsworth & Whitney Co.
Hudson Pulp & Paper Co.
International Paper Corp. Southern Kraft Division *(7 Plants)*
Joutseno Pulp (Finland)
Katchikan Pulp & Paper Co.
Kalamazoo Vegetable Parchment Co.
A/B Kemi, O/Y (Finland)
Longlac Pulp & Paper Co.
Longview Fibre Co.
H. R. MacMillan Export Corp. Nanaimo Sulphate Pulp Div.
Macon Kraft Company
Marathon Paper Company
Mead Corporation *(2 Plants)*
Mo and Dongje A. B. Hasmas (Sweden)
National Container Corp. *(3 Plants)*
National Paper Corp.
North Carolina Pulp Co.
A/B Oulu, O/Y (Finland)
Oxford Paper Company
Pacific Mills Limited
Rauma-Repola Oy (Finland)
Riegel Carolina Corp.
St. Helen's Pulp & Paper Co.
St. Joe Paper Company
St. John's Sulphite, Ltd.
St. Mary's Kraft Corp.
St. Regis Kraft Corp.
St. Regis Paper Co. *(2 Plants)*
Howard Smith Paper Mills, Ltd.
Sorgo Pulp Co., Ltd.
Southern Advance Bag & Paper Co.
Southern Paperboard Co.
Thilmany Pulp & Paper Co.
Union Bag & Paper Co.
Union Corporation, Ltd.
United Paper Company
S. D. Warren Co.
West Virginia Pulp & Paper Co. *(2 Plants)*
Weyerhauser Timber Co. *(3 Plants)*

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Below—the three H.R. Hydrapulpers extending thru the operating floor and the discharge ends of the three conveyors shown above

If it's stock preparation, it's Shartle the leader, who can serve you best

Photos taken at National Gypsum's new mill at Pryor, Oklahoma

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prices resulting from higher American production costs. This is undoubtedly one reason for the continued dollar gap between values of United States exports and imports into this market.

Financial reports

A sudden drop in the stock market the week of August 18 did not seriously affect the range of prices for most paper mill securities, and on the contrary the improved outlook in the paperboard market had its effect in somewhat higher prices for stocks in the paperboard companies as compared with those in July.

Net incomes

Abitibi Power & Paper Co. Ltd.—Net income for six months ended June 30 was $4,404,055, compared with $5,441,158 for the same period last year.

American Box Board Co.—Net income for the six months ended May 31 was $631,945, compared with $937,313 for the similar period of the previous fiscal year.

Container Corp. of America—Net income for the first half of the year was $5,304,000, as compared with $7,526,000 in the same period of 1951.

Crown-Zellerbach Corp.—Net income for the year ended April 30 was $23,923,643, as compared with $25,323,650 in the previous fiscal year.

St. Regis Paper Co.—Net income for six months ended June 30 was $6,050,643, as compared with $9,180,272 in the first half of 1951.

Southern Advance Bag and Paper Co.—Net income in 1951 was $2,827,795, as compared with $2,579,544 in 1950.

Dividend declarations

Consolidated Water Power & Paper Co. has declared a third quarter dividend of 30 cents per share on outstanding stock, payable August 27 to holders of record August 12.

Eddy Paper Co. has declared a dividend of $3 on common, payable September 12.

Gair (Robert) Co. has declared a quarterly dividend of 30 cents per share on preferred stock, payable September 10 to holders of record August 20.

Glatfelter (P. H.) Co. has declared a quarterly dividend of 56¼ cents per share on the $50 par value 4½ per cent preferred stock and a dividend of 25 cents a share on the common, both payable August 1.

Hoberg Paper Mills, Inc. has declared a dividend of 75 cents on the common and 34⅜ cents on the convertible preferred stock, payable July 1 to stockholders of record June 19.

Sutherland Paper Co. has declared a quarterly dividend of 37½ cents per share on the $5 par value common and

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one of $1.10 per share on the 4.4 per cent cumulative preferred, both payable September 15 to record of August 15.

Paper mill corporate changes

Bowaters Southern Paper Corp. has arranged for a loan of $45,000,000 from a group of insurance companies and banks for the financing of its new Tennessee development.

Ketchikan Pulp Co. has placed up to $36,000,000 first mortgage bonds carrying 4½ per cent with four institutional investors. The bonds will be used to help finance the new dissolving pulp mill at Ward Cove, Alaska. The stock in the company is jointly owned by American Viscose Corp. and Puget Sound Pulp & Timber Co.

Rhinelander Paper Co. has borrowed $4,500,000 from Northwestern Mutual Life and John Hancock Mutual Life.

Scott Paper Co. has filed a registration statement requesting SEC approval for an issue of $24,952,800 in convertible debentures due September 1, 1977. The debentures will be offered to stockholders at $100 in debentures for each 12 shares of common. The underwriters will buy the unsubscribed debentures. Of the amount to be raised, $16,600,000 will be used to finance the construction of a paper mill adjacent to the company's recently purchased Soundview pulp mill in Everett, Wash.

New York Stock Exchange—Stocks

	Closing Prices Aug. 20, 1952	July 21, 1952
A.P.W. Products	4⅞	• 4⅞–5⅛
Celotex	17¾	17⅝
Same Preferred	• 16⅝–17	• 16¼–17
Certain-teed Products	14⅝	15
Champion P. & F. Co.	17⅛	29¼
Same Preferred	101⅝	99
Chesapeake Corp.	• 33–33½	30
Continental Diamond	12⅞	12⅞
Container Corp.	37¼	38
Same Preferred	100½	101
Crown Zellerbach	58¼	56½
Same Preferred	102½	102¼
Dixie Cup	• 34⅝–35½	34½
Eastern Corp.	• 18⅝–19	• 19⅝–19⅞
Robert Gair	16⅝	18½
Same Preferred	19⅞	19⅜
Gaylord Container	30⅝	• 31⅛–32
International Paper	49⅛	49⅛
Same Preferred	*100¼–101¾	*102½–103
Kimberly-Clark	48⅜	47⅜
MacAndrews & Forbes	• 40¼–41	41⅜
Marathon	25⅜	26¼
Masonite	25⅜	27½
Mead Corp.	24½	23¼
Same Preferred	• 86¾–87½	• 88–89
National Container	11⅛	11
Ravonier, Inc.	23	21⅞
Same Preferred	35¼	• 34½–34½
Scott Paper	52⅛	56
Same 3.40 Preferred	• 92–93	• 91–92½
Same $4 Preferred	*103¾–105	*103¼–105½
St. Regis	19⅛	13⅞
Same Preferred	• 93–94	93
Sutherland Paper	25⅞	23½
Same Preferred	• 107¼–109	*108½–108¾
Union Bag & Paper	47⅜	46⅜
United Board & Carton	• 14¼–14⅝	• 13⅞–14
United Wall Paper	2⅞	3⅜
Same Preferred	• 24½–25½	• 24½–25½
U.S. Gypsum	116¼	114
Same Preferred	*175½–177	*175½–177
West Virginia P. & P. Co.	• 80½–81	74½
Same Preferred	*107½–109	*107¾–109½

New York Stock Exchange—Bonds

Celotex 3½%	99¼	98⅝
Champion P. & P. Co. 3%	—	100
Mead Corp. 3%	—	100

New York Curb Exchange—Stocks

Am. Writing	9¾	10½
Brown Co.	10⅛	10½
Brown Co. $5 Preferred	105½	104
Same $3 Preferred	50½	50
Great Northern Paper	54	54⅜
Hammermill	17¼	18⅛
Puget Sound	30	—

* Closing Bid and Asked Prices

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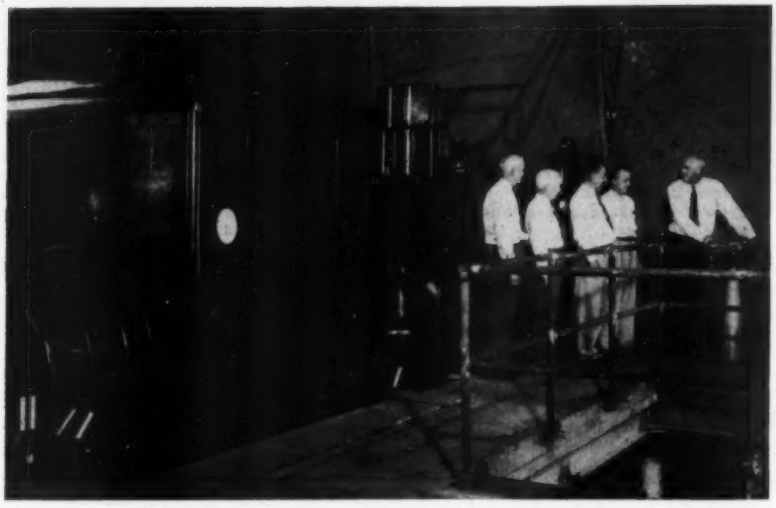
News of the Industry



NEW TURBO-GENERATOR recently started up at Eastern Corp.'s Lincoln, Maine mill. At the controls is Charles G. Paine, vice president and general manager. Others are (l to r): E. L. Aldrich, mechanical superintendent; Harry C. Lord of John A. Stevens Inc.; Max D. Getchell, Eastern's chief engineer, and Harold Holden, president of Eastern

Eastern Corp. Puts New Power Plant in Operation

THE MODERNIZED AND ENLARGED steam and electric generating plant at Eastern Corp.'s Lincoln, Maine, paper and pulp mill went into full operation August 14 when the General Electric 3125-kva turbo-generator was started up.

Lincoln is a fully integrated mill manufacturing business papers and woodpulp, representing 40 per cent of the firm's productive capacity. The mill supplements Eastern's main production plant, which is located in Brewer.

The new turbo-generator is of the double-admission, double-extraction, condensing type, generating 3-phase 60-cycle current at 600 volts. It supplements a smaller low-pressure unit. In normal operation, steam is admitted to the turbine throttle at 600 pounds pressure. Passing through the turbine, steam is bled off at 135 pounds and 40 pounds pressure for process use in the pulp mill and paper mill.

Expansion program completed

Completion of the Lincoln turbo-generator installation rounds out a power plant expansion program at this mill begun in 1949 with the transfer of two low-pressure boilers from the company's mill at Brewer and the installation of a new Babcock & Wilcox high-pressure boiler producing steam at 620 pounds. The boiler plant now consists of three low-pressure boilers and one high-pressure unit, having combined capacity of 250,000 pounds of steam per hour.

Until the new turbo-generator went on the line, all boilers were producing low-pressure steam for process use and for operating the old generator at 150 pounds pressure. As planned, the high-pressure boiler and the new turbo-generator operate as a matched unit, and the low-pressure boilers produce steam principally for process use. When the high-pressure boiler is shut down periodically for maintenance, the turbine will draw 140-pound steam from the low-pressure boilers and generate approximately 2,700 kva.

A new building has been completed to house the new turbo-generator, arranged to permit expansion when another unit is added.

Conversion of the Lincoln power plant to high-pressure generation provides steam electric power at much lower cost for this mill and is a part of a large capital expenditure resulting in lower cost of pulp and paper. The advantage of low-cost double-use steam is obtained through design of the plant for a close balance between steam for power generation and steam for process.

Both this mill and the Brewer mill burn No. 6 fuel oil. Large oil storage capacity, coupled with the ability to take oil from ocean-going tankers at the firm's ice-free unloading terminal located at Bucksport, virtually assure an adequate oil supply for both mills at all times.

A similar program was carried out at the Brewer mill in the building of a new steam and electric generating plant of 10,000 kva. capacity, which went into operation in 1948. Thus a significant forward move has been completed in providing a low-cost steam and electric power supply for the company's pulp and paper manufacturing establishment, with minimum likelihood of interruption from outside causes. The combined power generating capacity at Lincoln and Brewer can provide for the average load at both mills, and current can be transferred from one mill to the other as needed over the local power company's lines.

The Lincoln power plant project was planned by Eastern's engineering department under the direction of Max

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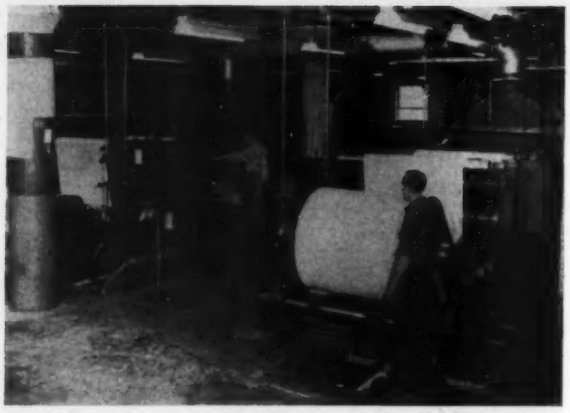


MODERNIZATION OF FACILITIES at Bemis Bros. Bag Co. in Peoria, Ill., features a new clay coating plant for the production of coated paper for flour bags; the new coating line was engineered by Dilts Machine Works, division of the Black-Clawson Co. The Kohler winder reel (left) is designed to make flying starts at 850 fpm; it can wind rolls 60 inches wide, 40 inches diameter and weighing 3,000 pounds under tensions ranging from 1 to 6 pounds per inch. Two new Dilts double embossers (right) were also installed; the large machine has a roll face of 66 inches, while the smaller unit has a 47-inch roll face

D. Getchell, chief engineer, with the cooperation of John A. Stevens Inc., Lowell, Mass.

Rhinelander Installs New Manufacturing Process

More locally-produced wood can now be used by Rhinelander Paper Co. at Rhinelander, Wis., as the result of the installation of a new manufacturing process. The equipment incorporates the semi-chemical pulping technique, making possible the use of wood previously not suitable for the manufacture of glassine and greaseproof papers.

Experimentation with the process, successful in other types of paper manufacturing, was begun by Rhinelander in 1942, but progress was interrupted by the war years. Additional research in the post-war period confirmed the belief that the process was adaptable for glassine and greaseproof paper production. Complete installation of equipment is expected by October 1.

Scott Announces Everett Plans

Plans to begin construction of a paper mill at Everett, Wash., were announced recently by Scott Paper Co. The plant is to be built adjacent to the firm's Soundview Division pulp mill, with work on the new facility scheduled to start early next year.

The paper mill will be equipped initially with one high-speed paper machine, together with appropriate converting and finishing equipment, and will have sufficient floor space and boiler plant capacity for the future installation and operation of a second paper machine.

In announcing the project, Thomas B. McCabe, president of Scott, declared, "This will be Scott's first paper mill on the West Coast and is a logical step following the merging of Soundview Pulp Co. into Scott Paper Co. on November 9, 1951." The new paper mill will create an integrated operation from trees to finished products, permitting the manufacture of uniformly high quality products. Papermaking facilities on the West Coast will also make it possible for Scott to provide improved service to its customers in this large and rapidly expanding market.

The mill, which is expected to be in operation sometime in the first quarter of 1954, will increase by about 250 the number of employees at Scott's Everett plant.

Hammermill May Expand

The possibility of a $15,000,000 outlay for expansion of Hammermill Paper Co. at Erie, Pa., was revealed recently by Donald S. Leslie, first vice president and general manager of the firm. Mr. Leslie spoke at the opening session of the firm's 39th annual agents' conference.

The executive said the cost of the planned expansion was covered by a certificate of necessity recently granted by the federal government. Already a new paper machine has been purchased, Mr. Leslie said. It is to be installed and put into operation in the near future.

Southland Paper Mills Acquires Lumber Firm

Southland Paper Mills Inc., Lufkin, Texas, has purchased controlling interest in Texas Long Leaf Lumber Co. at Trinity. The transaction includes 200,000 acres owned by the lumber firm, along with sawmills and other properties.

According to R. W. Wortham, Southland's executive vice president, the paper manufacturing firm will place the land under intensive forest management to produce the maximum amount of both pulpwood and saw timber. "While it is recognized that for some years the Texas long leaf lands have been overcut, we believe that a substantial amount of lumber production, as well as increased pulpwood production, will be maintained," Mr. Wortham declared.

All the newly acquired land is within 60 miles of the Southland mill. Prior to the purchase of Texas Long Leaf, Southland owned 130,000 acres, though the bulk of its pulpwood is bought under contract from private operators.

Southland began operations in 1940 with a $6,000,000 newsprint plant. Four years later it put a $4,500,000 kraft pulp mill into operation and still later added another unit to its newsprint plant, doubling the capacity. Total investment prior to the purchase of the lumber firm was approximately $20,000,000.

New Wisconsin Firm Organized

Green Bay Tissue Mills, a recently organized firm, is placing on the market a wide assortment of converted paper products and a varied line of lightweight papers. Main offices are in Green Bay, Wis., with production facilities located at Shawano. Additional manufacturing facilities are being established in other locations soon to be announced.

Officers of the new firm are: Paul L. Lewis of Neenah, president; Robert F. Graham of Winnetka, Ill., vice president; Heber H. Pelkey of Appleton, secretary; Charles N. Egan of De Pere, treasurer, and Eugene C. Ballman, also of De Pere, assistant treasurer.

Mr. Lewis was for many years associated with Brown Co., Berlin, N.H., and also Steiner Sales Co. Until recently,

Paul R. Lewis

Charles N. Egan

he served as sales manager of Wisconsin Tissue Mills. Mr. Egan is also president of Little Rapids Pulp Co., De Pere, and of Shawano Paper Mills at Shawano.

Papers being offered include the recently developed line of bleached Baytissues and an assorted variety of decorative wrapping papers in 20 stock patterns and in special printed designs. Special facilities are set up to produce specification papers in the lighter weights in both sulphite and sulphate wrapping stock. In the nation-wide distribution now being established, special emphasis is being given to M.G. ream tissues packed in cartons, florist tissues in both white and colored, plain and waxed stock, and anti-tarnish papers.

New Hood Installed by Manistique Pulp & Paper

Installation of a new asbestos hood over the paper machine at Manistique Pulp & Paper Co., Manistique, Mich., was to be completed early in July. The new hood replaces a wooden one in service for the past 20 years. Supplier for the project was Taylor Insulating Co., Merrill, Wis. Taylor technicians supervised the work.

The sides of the new hood are constructed of four-foot removable panels, while the ceiling is equipped with three exhaust ducts for the forced removal of moisture from the machine room. Included in the project is the installation of new fans, fan houses, and motors. The equipment is capable of removing 135,000 cubic feet of air per minute.

New Colorado Mill To Make Newsprint

Announcement was made July 14 of the formation of Columbine Pulp & Paper Inc. for the production of newsprint in western Colorado. Officials of the new firm, among them several Colorado newspaper publishers, reported that a plant is to be built between Grand Junction and Glenwood Springs.

It is hoped that Columbine can obtain through purchase or merger the holdings of Columbine Development Corp., which has conducted considerable research into a proposed newsprint mill in the western Colorado area.

The development corporation holds a certificate of necessity from the Defense Production Authority, which places the proposed mill in a defense construction category. Columbine Development also holds a timber sale contract with the U.S. Forest Service.

Rome Kraft Construction Begins in Georgia

Workmen began pouring the foundations on July 14 for the new Mead Corp. plant in Rome, Ga. Maxon Construction Co. of Dayton, Ohio, holds the contract to build the structure at a cost exceeding $25,000,000. The plant, known as Rome Kraft Co., is owned by both Mead and Inland Container Corp. of Indianapolis and is to begin production in 1954. The facility has been designed to produce an annual 200,000 tons of kraft liner board.

The new Georgia plant will consume about 350,000 cords of southern pine annually and will handle all steps in the manufacturing process—from pine to pulp to paperboard. Some 650 persons are to be employed in the mill, with about 1,200 workmen outside the mill supplying wood.

Expansion Notes

St. Regis Kraft Corp.
applied in Florida recently for a permit to dredge material from the confluence of the St. Johns and Broward rivers at its Eastport mill. The area to be dredged will be about 1,200 feet long, extending 200 feet channelward from the mean low-water shore line.

National Container Corp.
has opened a stock box division at its Long Island City, N.Y., plant and a warehouse in the New York City garment and millinery district. The new division will carry large quantities of more than 75 different sizes of kraft corrugated stock-size shipping boxes used by the clothing industries. All boxes will be manufactured in the firm's Long Island City plant from kraft board produced in its five kraft paper mills.

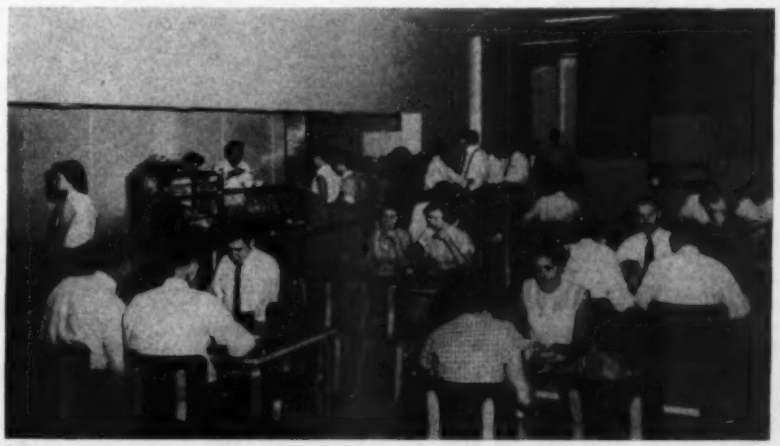
Geo. A. Whiting Paper Co.
filed articles of incorporation at the Winnebago County (Wis.) register of deeds office recently. The firm's capital stock was listed at $300,000, which is to be divided into 3,000 shares at $100 par value. The articles were signed by G. A. Whiting of Menasha, president of the company, and P. J. Gazecki.

Tremendous Expansion
is due for the Idaho and Montana pulp and paper industry, according to S. Blair Hutchinson, range specialist. Mr. Hutchinson has declared that there is enough timber east of the Continental Divide in Montana alone to supply eight pulp mills. Currently, there is only one such mill in the Idaho-Montana area.

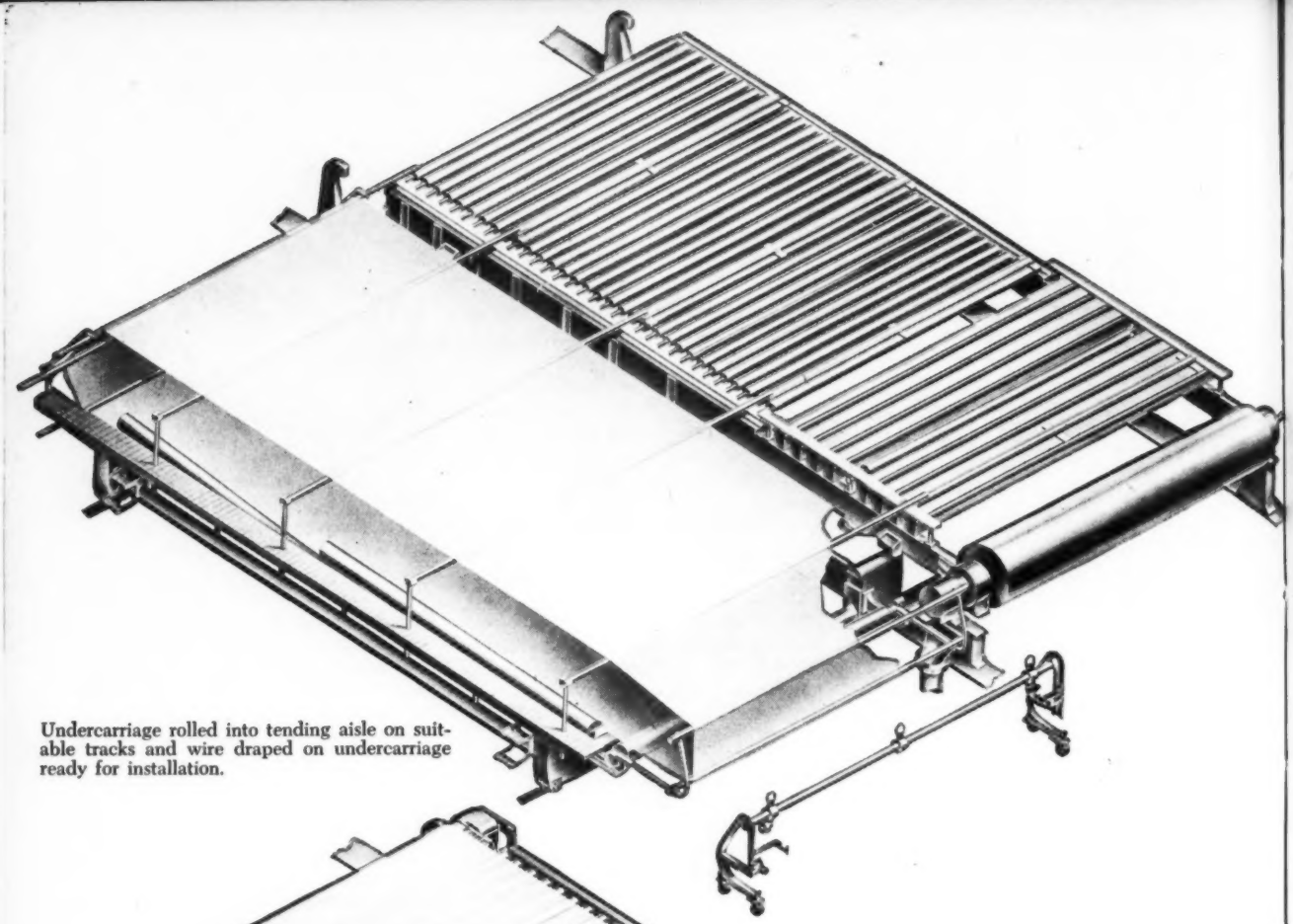
Bowaters Southern Paper Corp.
has let contracts for the construction of a new $50,000,000 newsprint and sulphate pulp mill at Calhoun, Tenn. Firms granted contracts were Fraser, Brace & Co. and Turner Construction Co., both of New York, N.Y., and Roane Anderson of Calhoun. The new mill is to be capable of producing 125,000 tons of newsprint and 50,000 tons of sulphate pulp annually. It is expected to be in operation early in 1954.

Paper Manufacturers Co.,
Philadelphia converters, recently dedicated its new plant in the Bustleton section of the city. The ceremonies marked the completion of an expansion program that started five years ago.

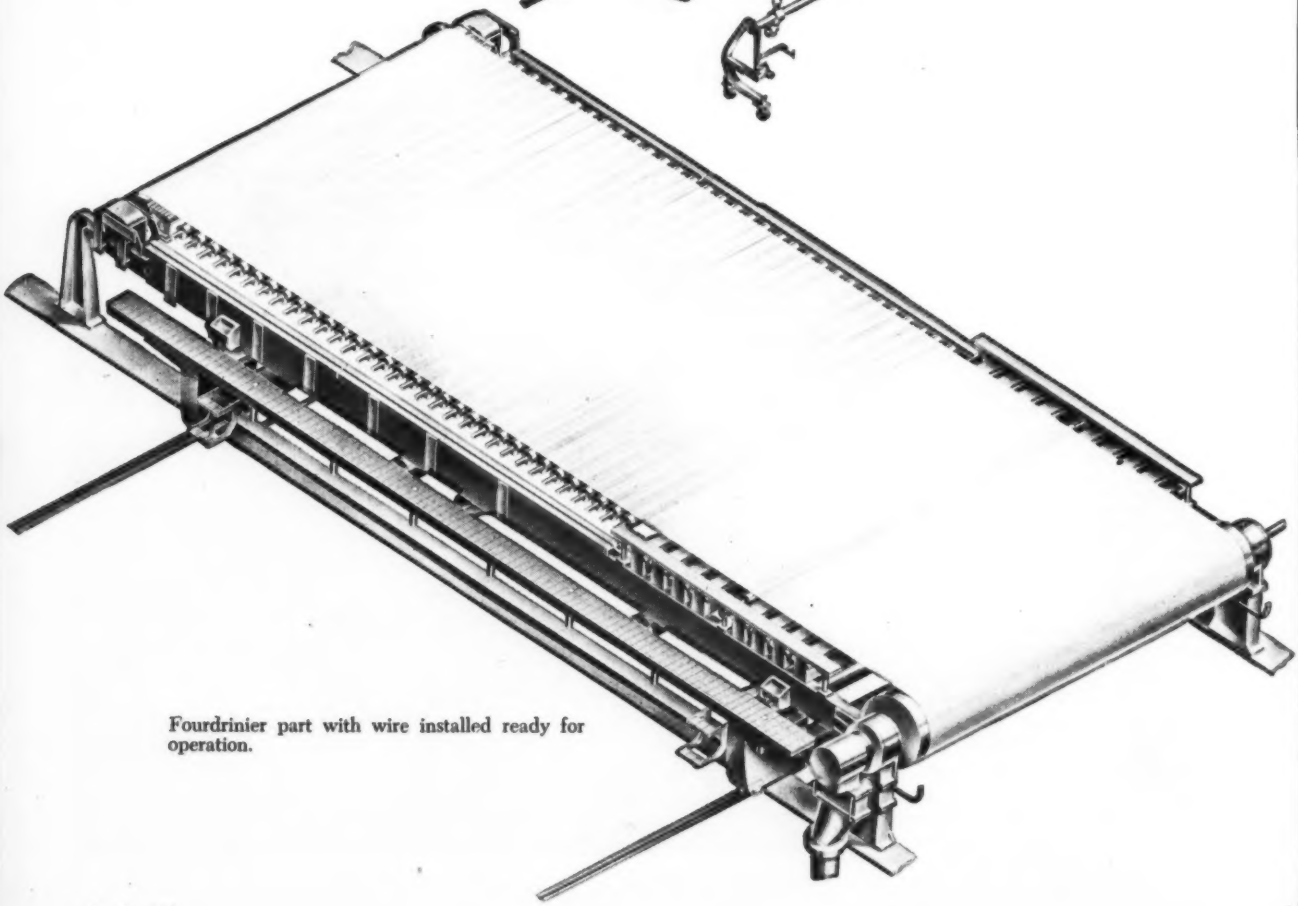
Paisley Products, Inc.,
Chicago, has announced the purchase of



MODERN CAFETERIA opened in early August at Gardner Board & Carton Co. in Middletown, Ohio; it seats about 112 and covers 2,000 square feet; served in the new cafeteria are employees of the general office, Mill No. 2, and the Middletown carton plant



Undercarriage rolled into tending aisle on suitable tracks and wire draped on undercarriage ready for installation.



Fourdrinier part with wire installed ready for operation.

Fourdrinier part of "Rapi-Drape" design.

"RAPI-DRAPE" Scores Again

"Rapi-Drape" Wire Handling is now being used successfully in these outstanding mills:

P. H. Glatfelter Co., Spring Grove, Pa.
Southland Paper Mills, Inc., Lufkin, Texas
Hollingsworth & Whitney Company, Mobile, Ala.
Southern Advance Bag & Paper Co., Hodge, La.
St. Mary's Kraft Corp., St. Mary's, Ga.
Union Bag & Paper Corp., Savannah, Ga. (2)
Hudson Pulp & Paper Corp., Palatka, Florida (2)
Southern Paper Board Corp., Port Wentworth, Ga.
Fibreboard Products Inc., East Antioch, Calif.
St. Regis Paper Co., Tacoma, Wash.
Calcasieu Paper Co., Elizabeth, La.
San Rafael Paper Co., Mexico, D. F.
Papierfabrik Utzenstorf, Switzerland
National Newsprint Co., Ltd., India
Container Corp. of America, Cali, Colombia, S. A.
Brown Paper Mill Co., Monroe, La.

On order for:

Nekoosa Edwards Paper Co., Port Edwards, Wis.
Union Bag & Paper Corp., Savannah, Ga.
St. Joe Paper Co., Port St. Joe, Fla.
West Tacoma Newsprint Co., Tacoma, Wash.
Fraser Paper, Ltd., Madawaska, Me.
Camp Mfg. Co., Franklin, Va.

One of the largest southern mills reports a complete wire changing record of 65 minutes down-time from reel to reel. This particular fourdrinier wet end is equipped with wire 236" wide and 120 ft. long.

In addition to all new Puseyjones machines equipped with this efficient wire changing device, the mills have found it profitable to change over old machines due to the many advantages obtained. Under construction at present are 3 fourdriniers, one 194", one 212" and one 220" wire width, equipped with "Rapi-drape" that will replace old style removable type originally supplied with each machine.

In "Rapi-drape" Wire Handling, pioneered by Puseyjones, the fourdrinier as a unit remains in the operating position. The back side of the fourdrinier is supported on rigid frames and the front side on a removable hydraulic power-operated under-carriage so that the fourdrinier is supported in perfect alignment at all times. It is unnecessary to detach the shake, suction boxes or shower piping. The only parts which must be removed are the dandy roll, deckle and cut squirts.

The results in terms of fast, safe wire handling are acclaimed by the many responsible operators and engineers who have this equipment in use. Be sure that your next machine is equipped with "Rapi-Drape" Wire Handling – one of many design improvements and labor-saving devices developed by Puseyjones.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products
Wilmington 99, Delaware, U. S. A.

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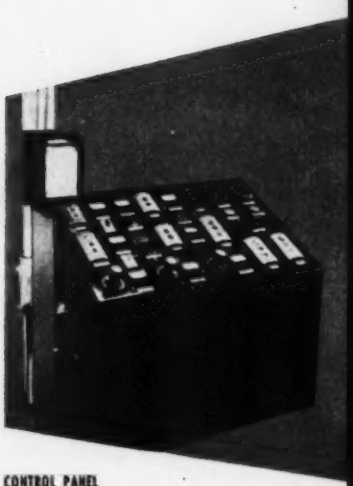
Egan

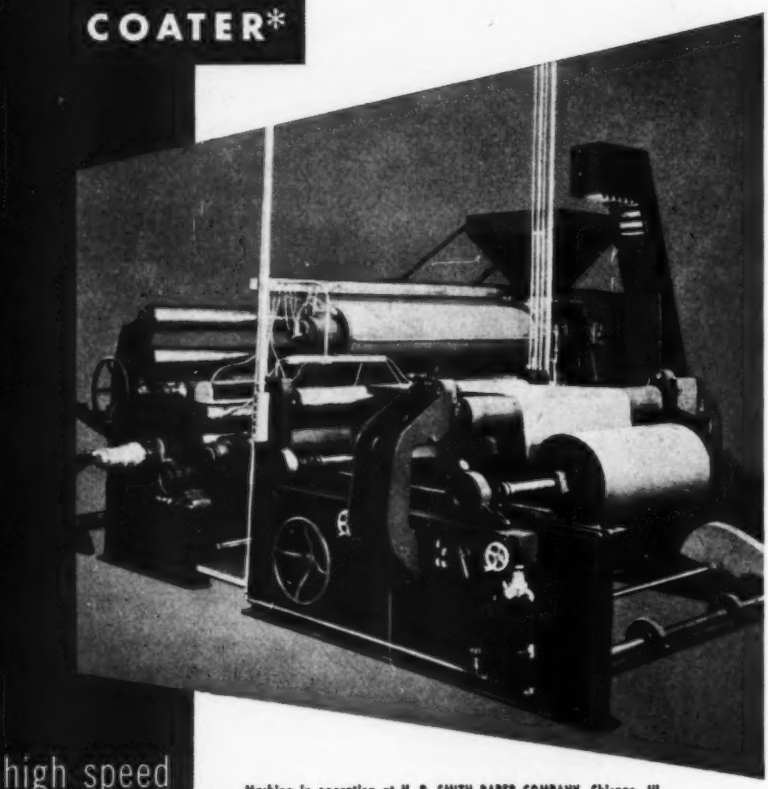
POLYETHYLENE COATER*



CONTROL PANEL

All controls are mounted in a special operator's control stand with the top panel inclined for ease of viewing and handling. Completely enclosed.

high speed continuous operation



Machine in operation at H. P. SMITH PAPER COMPANY, Chicago, Ill.

Another in the series of Frank W. Egan & Company developments and installations, this is the latest Extrusion-type coater for applying polyethylene at speeds up to 1000 FEET PER MINUTE.

The polyethylene is extruded from a die and the extruded film is laminated to the paper between the nip of two rolls.

This coater incorporates automatic splicing unroll and reroll equipment for high speed operation.

*With Patented Features

Send for pamphlets on cooling, treating and laminating

FRANK W. EGAN & COMPANY
Bound Brook, New Jersey
Designers and Builders of Machinery
for the Paper Converting and Plastics Industries
Cable Address: "EGANCO"—Boundbrook, N. J.

ALL TYPES OF CORRUGATED and solid fibre boxes are produced in this new converting plant recently opened by National Container Corp. in Rock Hill, S. C.; it is the 12th such unit operated by the company and serves customers in North and South Carolina, Virginia and eastern Tennessee

the plant, equipment, formulas, and manufacturing processes of the 50-year-old Layton Elastic Glue Co., also of Chicago. The acquisition will be operated as a subsidiary of Paisley. Layton is well known throughout the graphic arts, bindery, paper converting, wallpaper, and industrial manufacturing fields.

American Seal-Kap Corp., a producer of closures for milk bottles and other containers, is entering the paper cup field. Through a wholly owned subsidiary, it has acquired Champion Container Co.'s equipment for making paper hot drink cups.

Northwest Chip Salvage Hailed as Timber Saving

A saving of 9,000 acres or more of old growth timber a year in the Northwest has been forecast as the result of a program whereby leftovers from sawmills and plywood plants are converted to chips for use in the manufacture of heavy duty paper and cardboard boxes. According to a survey completed by the West Coast Lumbermen's Association, the point will be reached within two years at which the use of wood chips from salvaged materials by the kraft paper industry will reduce the cutting of lumber by nearly 700,000,000 board feet annually.

It has only been in the last three or four years that chippers in growing numbers have been installed in the Northwest and California. There are now more than 100 in use, and new ones are being put in operation at the rate of seven a month. Their use has been forced by economic conditions.

The present installations, it is estimated, are resulting in a saving of at least 400,000,000 board feet of Douglas fir and other soft woods per year. Ten kraft mills are now in operation in the region, with another under construction. About half of the present daily paper production of 2,750 tons comes from the white wood chips from by-products that were once used principally as fuel. Chips in some instances are being hauled by truck for distances up to 100 miles, while railroads are hauling them in some instances more than 200 miles. There is also much movement of chips by barge.

It is expected that within two years chips from salvaged waste products will provide 70 per cent of the needs of the growing kraft industry. According to Ralph G. de Moisy, director of the Washington Institute of Forest Products, a new inventory this year would show "less than 54 per cent of the solid residuals at sawmills that we found in 1948-49." He declared that this means a reduction of 10,000,000 cubic feet annually of material formerly considered a nuisance.

However, the kraft industry is facing competition for the sawmill wastes. This is because of the growth of the wood chemical industry in the Pacific Northwest. Leftover wood and sawdust are being converted into such products as hardboard panels, ethyl alcohol, dusts, fibre and cork items, charcoal, tannin liquors, high-grade wax, etc.

U. of Florida Asks Funds for Laboratory

The University of Florida has asked the state for a $100,000 grant for the construction of a wood pulp research laboratory. In its request the school virtually guaranteed that the research would eventually net the state "millions of dollars."

Appearing before the state cabinet, Dr. J. Hillis Miller, university president, declared that the school's research and experiments with Florida scrub oak has led to the development of a new type of paper. The university has also developed a wood pulp that can be used in making various rayons and plastics, he added.

Dean Joseph Weill, who has been leading the scrub oak experiments, said that the school has contracts totaling $365,000 for continuing research "if we just had a plant." Various manufacturers and industries have loaned necessary equipment and money for further experiments, "but we can't take contracts for research because we need an enlarged laboratory."

The cabinet voted to appoint a committee to study a plan suggested by Gov. Fuller Warren that would ask Florida pulp and wood industries to finance part of the cost of building the laboratory. The state's Internal Improvement Board could then finance the remainder. "I believe the pulp and paper mill owners in the state should be willing to sort of grubstake us in this," the governor declared. "This would be a chance for private industry to step in and fill some of the vacuums which have been filled by the federal government."

First Time in 18 Months: Wastepaper Demand Tops Supply

Mill demand for wastepaper is exceeding supply for the first time in 1½ years, according to dealers in the Midwest. The expected boost in mill quotations after Labor Day has caused many merchants to bid up prices in an effort to get needed supplies.

During the long wastepaper depression prices went so low that collections dwindled to far below normal. Whereas not too long ago collections were being discouraged, now dealers are soliciting business.

On a theoretical basis, mill quotations for mixed paper at $8 a ton, news at $12, and corrugated at $18 are unchanged. However, the only material moving at these prices is that on old orders; and stock being received now, in most cases, is being earmarked for September delivery at September prices.

Receipts of fibrous materials other than wood pulp by paper and paperboard mills in June totaled 654,169 tons. Consumption was 707,714 tons, and inventories at the end of the month were 973,027, a decline of 5 per cent from May. Wastepaper receipts in June were 589,173 tons, compared to a 604,691-ton consumption during the preceding month. Stocks on hand dropped 3 per cent to 548,128 tons.

Urge Use of Potato Starch in Papermaking

The Potato Industry Council of Maine Inc. has revived plans to study the possibility of using potato starch in paper manufacture. A contract for this purpose has been signed with the Maine Institute of Potato Starch Manufacturers, the Maine Potato Tax Advisory Committee, and the Department of Industrial Cooperation at the University of Maine.

Purpose of the resarch will be to benefit both the tremendous potato-growing industry and the many paper manufacturers in the state. An expansion of the

NEW DEAN of the New York State College of Forestry at Syracuse University, Dr. Hardy L. Shirley (left) is welcomed to his new post by Dean Emeritus Joseph S. Illick

Dr. Shirley Appointed Dean at Syracuse

Dr. Hardy L. Shirley has been appointed dean of the State University of New York's College of Forestry at Syracuse. He has been acting dean since January 1, when Dr. Joseph S. Illick retired. Dr. Illick has been named dean emeritus of the college that he headed six years.

The new dean joined the college as assistant dean and professor of forestry in 1945. He was previously with the United States Forest Service 16 years, beginning as a silviculturalist in 1929 and serving as director of its experiment station at Philadelphia from 1939 to 1945. Dr. Shirley began his professional career as an educator, teaching mathematics at the University of Nevada for three years following graduation from Indiana University in 1922. He entered the School of Forestry at Yale University in 1925 and was awarded the Ph.D. degree there in 1928.

At Syracuse Dr. Shirley has been in charge of the research program, to which New York State gave an initial appropriation during his first year on the staff. The program now has its own director and a staff of 26.

Dr. Illick was Pennsylvania state forester before joining the staff of the College of Forestry in 1931 as professor of forest administration. His service as a forestry educator has already covered 45 years.

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use of starch by an industry within Maine would help starch manufacturers realize a higher price for their product, while also making it possible to pay growers a higher price for potatoes of off-grade. The work is to be directed by Prof. Irwin Douglass of the University of Maine department of chemistry.

Potato starch has been used in beater sizing, adding considerable strength to the sheet, according to various researchers. In the pulping process the addition of the starch helps to make the fibers adhere better, resulting in a smoother and stronger sheet.

According to the United Potato Division of the United Fresh Fruit and Vegetable Association, this country uses about 1,389,000,000 pounds of starch annually, of which 90 per cent is corn starch. Maximum production capacity for potato starch is about 89,000,000 pounds.

Potato starch is consumed roughly as follows: textiles, 30 per cent; foods, 20 per cent; paper, 20 per cent; dextrins, 15 per cent; confectionery, 5 per cent, and miscellaneous, 10 per cent.

Expansion in Newsprint Falls Short of Goal

The government program to increase domestic newsprint output 50 per cent by 1955 has bogged down at the three-quarter mark. According to NPA, tax benefits have been granted for boosting the production by an annual 375,000 tons. The goal is 494,000 tons. There have been no applications for the remaining 119,000 tons.

Shortly after the NPA announcement, publishers meeting with government spokesmen in Washington, D.C., said that the "Boston plan" for reducing the wastage of newsprint is being abandoned because of legal difficulties. They said, however, that recommendation has been made for further study and experimentation to see whether it is practicable to conserve newsprint by cutting down on the width of newspaper columns.

Although domestic production has increased during the past year, U.S. publishers still must lean heavily on Canadian sources for their newsprint. This year through May U.S. production outran a year ago by 7 per cent, and it's 11 per cent over the pre-war 1941 rate. Yet our needs have risen far faster. We now import more than 80 per cent of our needs, against about 70 per cent in 1941.

Michigan Mill Produces Newsprint from Poplar

I. Lawrence LeSavoy, president of Paper Corp. of America, has announced that the firm's Cheboygan, Mich., paper mill is successfully producing newsprint from poplar pulpwood.

The mill is employing a new process developed by the University of Wisconsin. Mr. LeSavoy declared that when the plant began the manufacture of paper from poplar pulp it marked the first time that such pulp had been successfully adapted for newsprint production.

Mexico to Attempt Newsprint Production

According to a recent report of Mexico's National Bank of Foreign Trade, efforts are being made in that country to produce newsprint. The report declares, "This is absolutely necessary, not only to protect Mexico's foreign currency reserves, but because the newspapers are dependent completely on foreign suppliers."

The country's 22 production units manufactured 120,000 tons of various types of paper last year, compared to only 70,000 tons produced five years ago. Most of the domestic paper is used for wrapping, packing, commercial printing, sanitary and letter-paper uses. The nation still relies on its imports to obtain newsprint, cigarette paper, cellophane, and photographic paper.

Experimentation is currently being made to produce newsprint within the country from bagasse — sugar cane waste. Thus far the experimental product has not been of sufficient high quality necessary for newsprint. Officials of PIPSA, the newsprint import and distributing agency for Mexico, state that research will be continued, with plans now under consideration for the establishment of a large newsprint mill in the state of Durango for the carrying out of this work.

Quebec Newsprint Output up 1,251,000 Tons in 16 Years

Both the production and comparative value of newsprint has jumped appreciably in the Province of Quebec during the last 16 years. In 1935 production stood at 1,624,332 tons, while in 1951 it was 2,875,000 tons. During the same period the value of the product went from $57,711,320 to $295,000,000, or more than five times the 1935 figure.

A corresponding rise in costs has been

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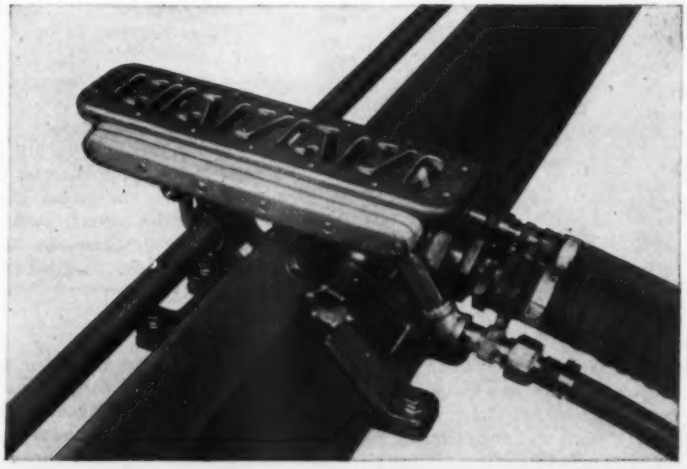
VICKERY FELT CONDITIONERS

with the latest "Jordan" type vacuum boxes and the new high speed drives



Take a hard look at your press felts as they're running today. Make certain that your Felt Conditioners have the capacity to keep them always fresh and open without mid-week shut downs or slow downs.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

led by greatly increased wages. In 1951 salaries paid to workers in the Quebec pulp and paper industry amounted to $91,000,000, as compared to the $20,042,836 handed out in paychecks to 15,080 employees in 1935. Last year there were no less than 25,000 men engaged in the pulp and paper industry of the province.

Demonstrating the growing importance of newsprint in the industry's economy in Quebec is the fact that the total productive value of all paper manufactured in the province in 1951 amounted to $420,000,000. If the newsprint total of $295,000,000 is deducted, there remains a balance of but $125,000,000 for the remainder of the paper field.

High Newsprint Price Forces Conservation

All possible conservation measures are being forced on many U.S. newspaper publishers as a result of the current all-time high in the price of Canadian newsprint. The cost squeeze has also resulted in an increase in newspaper prices. (Canada raised its export price of newsprint $10 a ton in June, making the New York, N.Y., delivered price $126.)

The increase added an estimated $50,000,000 to this country's annual publishing costs, since U.S. publishers depend on Canadian mills for approximately 80 per cent of their supply.

Canadian producers cited as justification for the price rise the weakness of the U.S. dollar, declaring that their return on exports to this country had fallen by about $10 a ton because of the shrinking value of the U.S. dollars they received in payment.

At that time the U.S. dollar was trading at a discount of 2½ cents. The discount at the present time is about 4¼ cents, which means that it takes approximately one U.S. dollar plus 4¼ U.S. cents to buy one Canadian dollar—the same Canadian dollar that used to be obtained for 94 or 95 cents U.S. coin.

July Newsprint Statistics

Production of newsprint in Canada (including Newfoundland) during July amounted to 485,539 tons and shipments to 483,250 tons. Output in the United States was 94,192 tons, while shipments were 94,933 tons, making a total North American production of 579,731 tons and shipments of 578,183, as compared with continental production of 544,936 tons and shipments of 533,841 in July 1951. These figures were released by the Newsprint Service Bureau.

The Canadian mills produced 108,304 tons more in the first seven months of 1952 than in the corresponding period a year ago, which is an increase of 3.4 per cent. The output in the United States was 38,590 tons, or 6 per cent greater than that in the first seven months of last year, making a total continental increase of 146,894 tons, or 3.8 per cent more than in the comparable period of 1950.

Stocks of newsprint at the end of July were 144,094 tons at Canadian mills and 8,827 tons at United States mills, making a combined total of 152,921 tons, as compared with 151,373 tons on June 30, 1952 and 153,595 tons at the end of July 1951.

Canadian Praises Newsprint Progress

Lands Minister J. S. Bourque of Quebec declared recently that progress in the newsprint industry over the last 10 years has been "amazing." In a speech prepared for delivery before the Quebec branch of the Technical Section of the Canadian Pulp & Paper Association, he said that capital invested in the industry in 1942 was about $349,000,000, while today it exceeds $464,000,000.

In 1942 the industry absorbed 4,000,000 cords of wood, compared with 5,000,000 today, and the value of pulp and paper mills products now has passed the $315,000,000 mark, compared with $112,000,000 in 1942. Progress in the industry has benefited employees, Mr. Bourque said, and salaries today amount to more than $75,000,000; they were $33,000,000 in 1942.

Newsprint Notes

Apparent Relief
in the world newsprint shortage was recently reported by the United Nations. However, the U.N. is keeping up a long-range program in an effort to prevent another shortage. The hunt for wood substitutes is being emphasized.

Crown Zellerbach Corp.
on July 25 announced a $10 per ton increase in newsprint contract prices. The move was not unexpected. United States mills have for several weeks been announcing price increases, following a $10 per ton boost by Canadian mills as of late May.

Great Britain
on July 31 fixed a price of $158.80 per ton for all newsprint produced in Britain. The existing arrangement, under which all newspapers pay the same price for newsprint whether domestic or imported, is to be continued.

Japanese Newsprint
production has been increasing since early this year, owing mainly to the higher domestic demand from newspapers, which have been adding more pages to their daily editions. Prices of newsprint, on the other hand, have tended to decline because of both the increased output and the general growth of paper production.

France has Announced
a reduction of two francs (about ½ cent) a pound in the price of newsprint, effective July 2. That would be about $160 a ton.

Conservation of Newsprint
keynoted the recent annual mechanical conference of the American Newspaper Publishers Association, which was staged in San Francisco. Among suggestions were: using as large a diameter of roll as possible, careful transportation from mill to pressroom, and leaving wrappers on rolls until they are on the press.

Sensenbrenner Will Includes Many Philanthropies

The will of the late F. J. Sensenbrenner of Neenah, Wis., chairman of the board of Kimberly-Clark Corp., was filed in probate court in Chilton, Wis., August 6. Among the grants were the following:

Marquette University, $400,000; the Institute of Paper Chemistry, $150,000; Premonstratensian Fathers of West De Pere, $150,000; the University of Wisconsin Foundation, $100,000, and the Catholic Diocese of Green Bay, $50,000. Lawrence College of Appleton was given $50,000, while numerous other bequests named Catholic organizations. The remainder of the estate was left in trust for Mr. Sensenbrenner's children, John S. and J. Leslie Sensenbrenner, and Margaret and Gertrude Bergstrom, all of Neenah.

$144 Million Loaned to Industry by Private Institutions in 1951

Fifteen paper and pulp manufacturers and six paper converters obtained $144,516,000, and three paperboard makers an additional $4,850,000, in 1951 from life insurance companies and other long-term lending institutions, according to the 1952 Yearbook of Private Placement Financing.

Largest loan in the paper and pulp manufacturing category was $40,000,000 in 3.75 per cent 20-year notes placed with a life insurance company by Rayonier Inc. Others included Crown-Zellerbach Corp. ($20,000,000); St. Joe Paper Co. ($12,000,000); Mead Corp. ($10,400,000); Brown Paper Mills ($10,000,000); Sutherland Paper Co. ($5,500,000); Nekoosa-Edwards Paper Co. ($5,000,000); St. Helens Pulp & Paper Co. ($4,000,000); Sorg Paper Co. ($3,000,000); Brunswick Pulp & Paper

DO YOU WANT
HIGH SPEED CUTTING?

INVESTIGATE THE
NEW DOWNINGTOWN
MASSON-SCOTT SUPER CUTTER & LAYBOY

Modern paper conversion requires high speed equipment to reduce production time and increase profits. A higher speed also reduces the number of cutter units required and, consequently, manpower, overhead, power consumption and other factors which govern cost.

The Downingtown Masson-Scott Super Cutter is a precision built machine, designed for sustained high operating speeds combined with an accuracy not usually found in rotary cutters.

Your Downingtown Sales Engineer will submit complete data about the Downingtown Masson-Scott Super Cutter and Layboy or write for Bulletin No. 252A.

Close-up view of the cutter cylinder on a Downingtown Masson-Scott Super Cutter.

View of drive side showing layboy at maximum height and full stacks.

MODERNIZATION IS CONSERVATION

DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Building, Portland 4, Oregon
Downingtown Fibrepulper, Manufactured in Canada by Waterous, Limited, Brantford, Ontario

DOWNINGTOWN
MASSON-SCOTT SUPER CUTTER & LAYBOY
DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1880

Co. ($2,708,000); Mosinee Paper Mills ($1,400,000); Combined Locks Paper Co. ($1,250,000); Lowe Paper Co. ($1,000,000); Downingtown Paper Co. ($1,000,000); Fitchburg Paper Co. ($750,000); Donohue Bros. Ltd. ($600,000); Hurlbut Paper Co. ($300,000), and Wausau Paper Mills Co. ($150,000).

W. Michigan Pulp, Paper Course Enters Adult Education Field

Western Michigan College's pulp and paper curriculum will enter the field of adult education this fall, offering evening courses to members of the paper and paper converting industries in the Kalamazoo area. The first year's subject is to be, "Converting of Paper and Paperboard."

The decision to enter adult education was made at a recent meeting of representatives of the extension service and adult education office at WMC, officers of the Kalamazoo Valley Section of Tappi, and officers of the Michigan Division of the Superintendents Association.

It was decided that both college credit and non-credit students would be accepted. For those not desiring college credit there will be no educational requirements for taking the course, but such participants will receive a certificate on completion of the study. Their fee will be $4.75 per semester hour. Those seeking credit will be assessed $9.50 and will be required to take a final examination.

Outstanding speakers of the paper and paper converting industries from throughout the country will be on hand to present the 30 lectures. It is planned that at the close of the series the lectures will be published in book form.

The course was organized jointly by Dr. A. H. Nadelman, professor and head of the pulp and paper technology curriculum; Otto Yntema, WMC extension director; Martin J. Galbraith, technical director of Sutherland Paper Co.; the following members of the Superintendents Association: Raymond Barton of Michigan Paper Co., Leon H. Mimms of Kalamazoo Paper, Theodore Burkhart of St. Regis, and Harrison Kindig of Mac Sim Bar, and members of Tappi as follows: A. T. Luey of Sutherland, Reginald Hurst of KVP, Richard Trelfa of Watervliet, James Dean of Michigan Paper, W. F. Hathaway of KVP, Fred C. Goodwill of St. Regis, and John R. Dam of Allied Paper Mills.

IRONING OUT management problems are these members of the Sorg council (l to r): George Bryan, employment and safety director; Everett Pieratt, assistant maintenance engineer; Don Goodman, technical superintendent, and Morrison Dorsey, superintendent of the Sorg Division

Management Council Instituted at Sorg Paper Co.

Sorg Paper Co., Middletown, Ohio, has formed a management council that gives middle management more leeway in solving company problems as well as training department heads to assume possible greater duties.

Company officials believe that greater participation in management promises to be a trend in modern industries. There are but a half-dozen management councils operating in America's factories today. Sorg is the first paper company to foster the fairly new idea.

The idea perhaps sprung in 1945 from Charles P. McCormick, president of McCormick & Co., tea and spice manufacturers, although it was termed "multiple management."

Sorg has been studying ways in which middle management could participate in functions of top management councils already in existence, and a special committee assigned to study the new idea recommended that the company institute such a council.

President Donald Driscoll pointed out the purpose of the council of nine men: "It is a group which will investigate possible improvements for our products, service to customers, employe relations, cost reductions, or any other problem of our company which is either brought to their attention or is recognized by the council members."

The council makes recommendations to higher management; has no power of execution; only of recommendation.

"It is felt that the council's studies and recommendations will contribute substantially to the success of the company," Mr. Driscoll said.

Complete representation

Each member of the council serves a term of nine months. They are representative of the various departments of Sorg as far as is possible. Any exempt salaried employe is eligible to become a council member. At the end of nine months, six will be retained and three will be voted out to be replaced with new members. Those elected to stay are selected on the basis of their value to the council and past record. The three new members are elected from the nine nominees.

Six of the nine members must approve any project which is recommended to top management. If the recommendation is not unanimously approved, a minority opinion is to be rendered, together with the majority recommendation.

Council members may request information about matters which may come before the council from any individual or department of the company through the division head. The president of the company has authority to send any employe to attend council meetings with privilege of expression. The council may request any exempt salaried employe to attend any meeting for consultation or advice on any problem, provided approval is received from the employe's superior and division head.

Outside advice

The management council may also request outside counsel with the president's approval. The council does not concern itself with execution of approved recommendations unless so directed by management.

"Experience on the council," Mr. Driscoll said, "will afford members excellent training. They will have opportunity to broaden their perspective and to handle problems of company-wide importance."

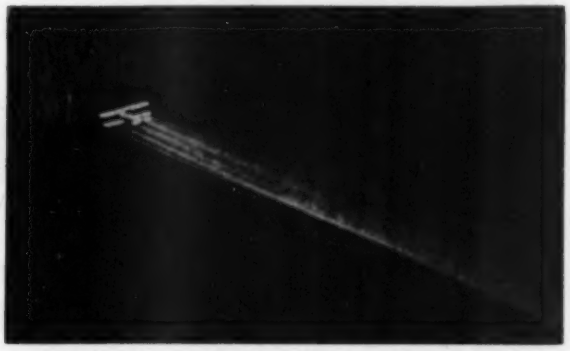
Mr. Driscoll explained that it is felt that the birth of this council is in line with the trend in industry to give a greater number of individuals more participation in management. "Higher management people will be able to ob-

serve and evaluate the abilities and needs of the younger members of management while they are participating in the work of the council," he said.

He said it is believed by leaders of the more progressive companies that greater participation in management adds substantially to a company's progress; brings out latent abilities; helps to create greater enthusiasm; brings about greater understanding of, and interest in, company policies and objectives, and in the final analysis brings about a greater degree of cooperation and efficiency.

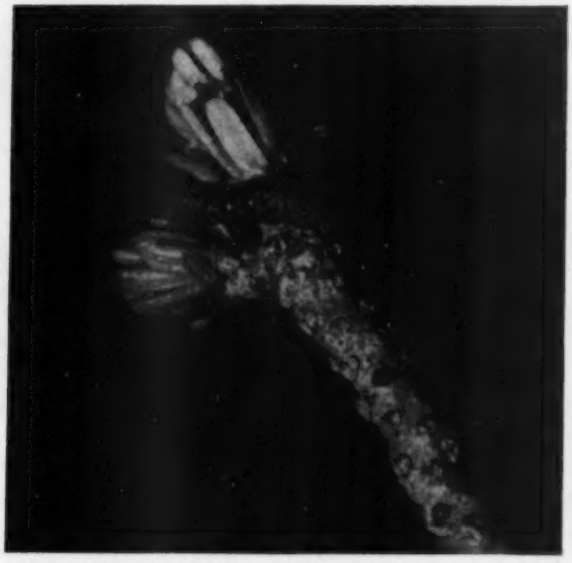
Charter members include Dan T. Dineen, sales coordinator, as chairman and George Bryan, employment and safety director, as secretary; Don Goodman, technical superintendent; Bob Foster, assistant purchasing agent; Clayton Bailey, assistant controller; Morrison Dorsey, superintendent of the Sorg Division; Walter Cassidy, product development manager; Russell Buck, chief chemist, converting, and Everett Pieratt, assistant maintenance engineer.

AIRFIELD CARVED FROM THE BUSH was the scene of frenzied activity during the 25 hours of the budworm operation



IMMENSITY OF THE OPERATION is shown through contrast of one of the spray planes and the limitless New Brunswick forest

REFUELLING was done at terrific speed, required an average of only two minutes per plane; each load was 125 gallons



SIXTH INSTAR stage of the spruce budworm, when it is feeding most heavily on the evergreen needles

Huge New Brunswick Spraying Operation Called Effective

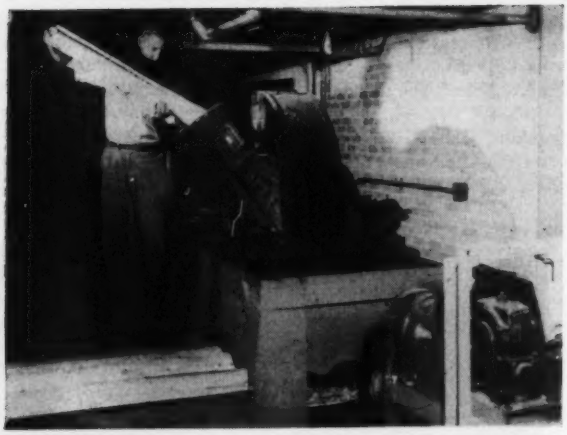
THE AERIAL SPRAYING of 300 square miles of New Brunswick forest infested by the spruce budworm has been termed successful by New Brunswick International Paper Co., which undertook the project jointly with the provincial government. The cost was approximately $500,000. (See THE PAPER INDUSTRY for May, page 188.)

The operation was aimed at checking the progress of the destructive budworm in a 193,000-acre Crown forest in northern New Brunswick containing more than 2,000,000 cords of valuable mature pulpwood. While the long-range effect on the balsam fir and spruce forest will not be known for some time, federal government entomologists who are continuing their on-the-spot observations report efficient insecticide coverage and high mortality of the insect.

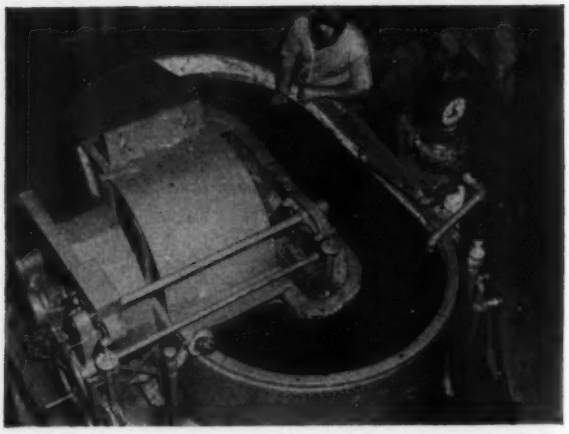
The spraying was completed successfully in the face of many difficulties. Unfavorable weather proved a considerable handicap, as high winds and rain prevented flying day after day. Dousing the forest with DDT at the rate of 125 acres per minute while the operations were in progress, the 20 spray planes finished the job just in time—only a few days before the insects would have entered the pupation stage.

Extensive preparation

The spraying operation was the climax of months of preparation. Last fall two 2,500-foot runways were carved out of the heavily wooded plateau situated



CHIPPING PONDEROSA pine pulpwood from the Nebraska forest



PULP BEATER used for papermaking experiments at the laboratory

Successful Experiment: Barren Nebraska Land Produces Pulpwood

A MAN-MADE FOREST launched in the midst of Nebraska's desolate sandhill country 50 years ago has demonstrated that this barren land can furnish high-grade pulpwood if given the chance.

From the Nebraska National Forest has come the raw material for a high-grade printing paper that was produced on the experimental papermaking equipment of the U.S. Forest Products Laboratory at Madison, Wis. And that same paper has been used for the programs issued for the celebration of the forest's fiftieth anniversary, September 10-14.

The forest is a unit of the publicly owned chain of national forests managed by the U.S.F.S. Consisting chiefly of such pines as ponderosa, red, Scotch, Austrian and jack, it came into being in 1902 largely because of the efforts of the well-known botanist, Dr. Charles E. Bessey. In that year in the midst of west central Nebraska he helped found a small nursery of pine seedlings.

EXPERIMENTAL FOURDRINIER on which the pamphlet stock was made

Ponderosa pine pulpwood was used to make the program stock at the Forest Products Laboratory. The pulp was manufactured by the conventional sulphate process.

A four-stage process was used to make a bleached pulp with good strength properties and high brightness value. The bleached pulp was processed in beaters and jordans and was made into a pamphlet stock about 0.008 inch in thickness on the laboratory's experimental fourdrinier paper machine. The paper was tinted pastel green and water-marked with a Forest Service seal. The narrow width of the machine made it possible to retain the natural deckle edges.

At the September celebration in Halsey, Neb., leading foresters from throughout the country saluted the ingenuity and vision of the men who founded and nurtured the forest.

---

in the approximate center of the spray area. Other facilities built during the winter included an access road to link the field with a New Brunswick International forestry road, establishment of housing facilities for the 150 persons engaged in the operation, and the portaging of 200,000 gallons of insecticide, 35,000 gallons of aviation fuel and other necessary fuel and equipment.

While the provincial government and New Brunswick International shared the cost of the project, the Canadian government supplied technical aid and assigned a number of entomologists and other officials to the project. The United States Department of Agriculture also cooperated, and many observers from both the U.S. and Canada witnessed the operation.

The center of the area covered in the project is situated 60 miles south of Dalhousie, where New Brunswick International operates a large newsprint mill.

Sixteen of the spraying planes were supplied by Central Aircraft Inc. of Yakima, Wash.; two were from Skyway Air Services, Langley, B.C.; Aviation Services, Moose Jaw, and Leavens Bros. Air Services, Toronto, supplied one spray plane each.

Northwest Forest Fires Out of Control; National Average Down for 1951

As fires in many regions of the West, Northwest and Canada roared out of control early in August, forestry officials feared other serious outbreaks in the drouth-stricken areas of the United States. Every precaution is being taken to prevent disastrous blazes, especially in the South and East, where lack of rain had brought about tinder-dry conditions in the woods.

Simultaneous with the current high hazard came a report from the United States Forest Service that 1951 saw a 21 per cent decrease in the number of forest fires. State and federal fire-fighting organizations reported a total of 164,090 fires during 1951, as compared to 208,402 during 1950. This represents a drop of 44,312 fires and is the lowest number reported since 1946. The U.S.F.S. stated that it is encouraged by the 1951 record because use of the woods for recreation has almost quadrupled since 1945.

The area burned showed an even greater decrease last year, dropping from 15,518,540 acres in 1950 to 10,781,039 acres in 1951. This is partially due to

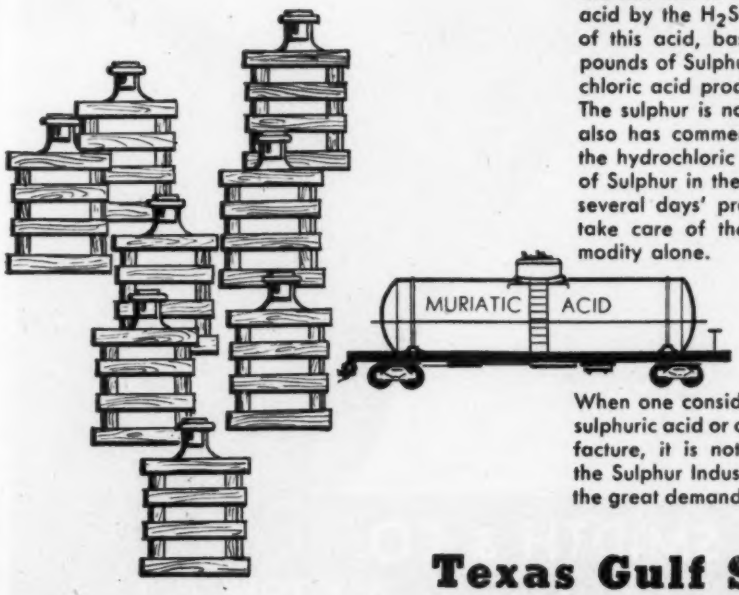
Sulphur

Loading a ship with Sulphur at Galveston

Thousands of tons mined daily, but where does it all go?

PARAPHRASING an old saying: 'It takes a chemical to make a chemical,' certainly applies to hydrochloric acid.

No chemical engineer has to be told how hydrochloric acid is made but sometimes with the mind focussed on the word "hydrochloric" little thought is given to another word "sulphuric." It is this word that calls attention to the fact that to make one net ton of 20° Bé hydrochloric acid by the H_2SO_4 process requires about 950 pounds of this acid, basis 100%, which is equivalent to 320 pounds of Sulphur. About one third of the annual hydrochloric acid production is made by the use of sulphuric. The sulphur is not lost because salt cake, a by-product, also has commercial value. But any way you figure it, the hydrochloric acid industry is an important consumer of Sulphur in the form of sulphuric acid. In fact, it takes several days' production from all the Sulphur mines to take care of the annual production of this one commodity alone.



When one considers all the other chemicals that require sulphuric acid or other Sulphur compounds for their manufacture, it is not difficult to appreciate how faithfully the Sulphur Industry is serving industry today in spite of the great demands made upon it.

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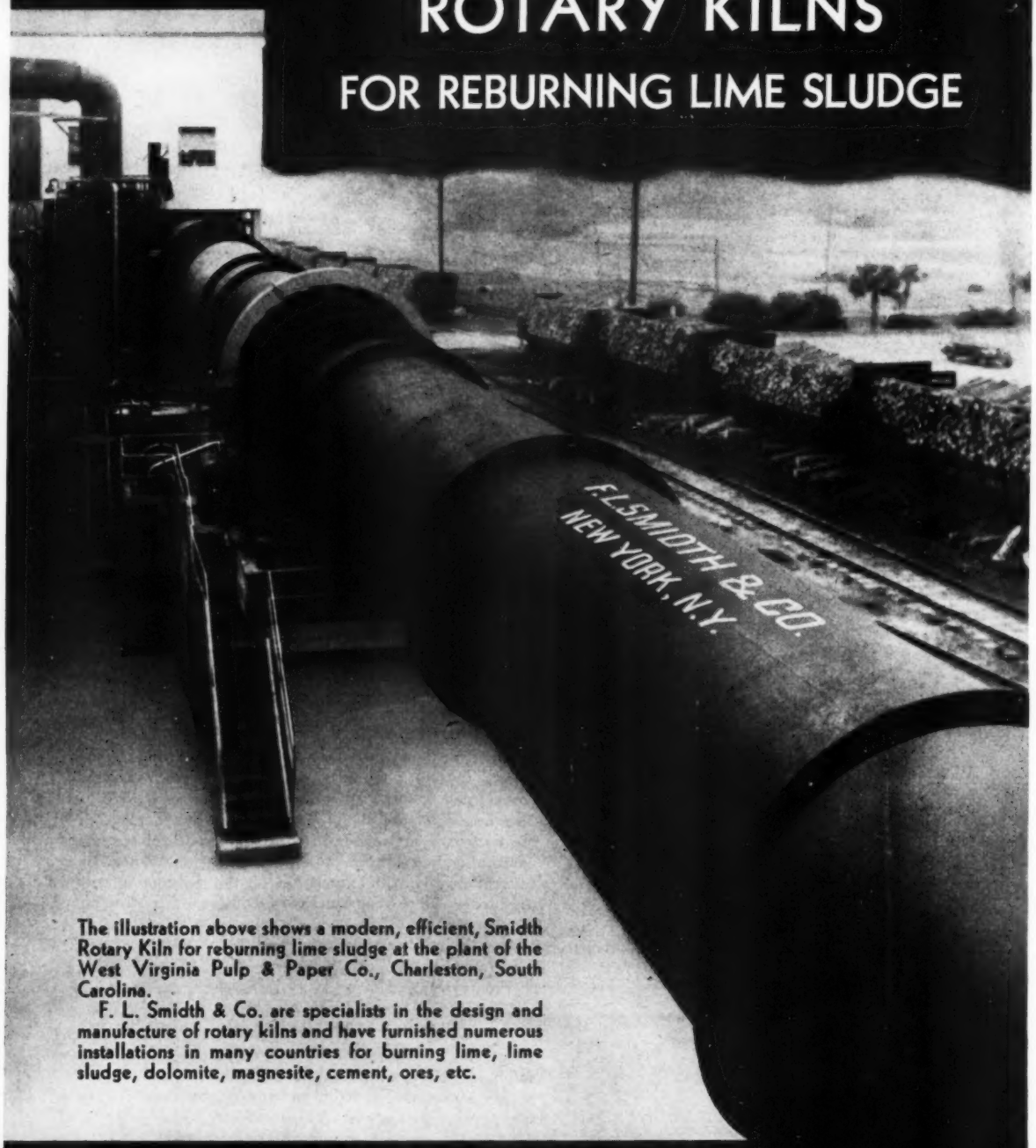

The illustration above shows a modern, efficient, Smidth Rotary Kiln for reburning lime sludge at the plant of the West Virginia Pulp & Paper Co., Charleston, South Carolina.

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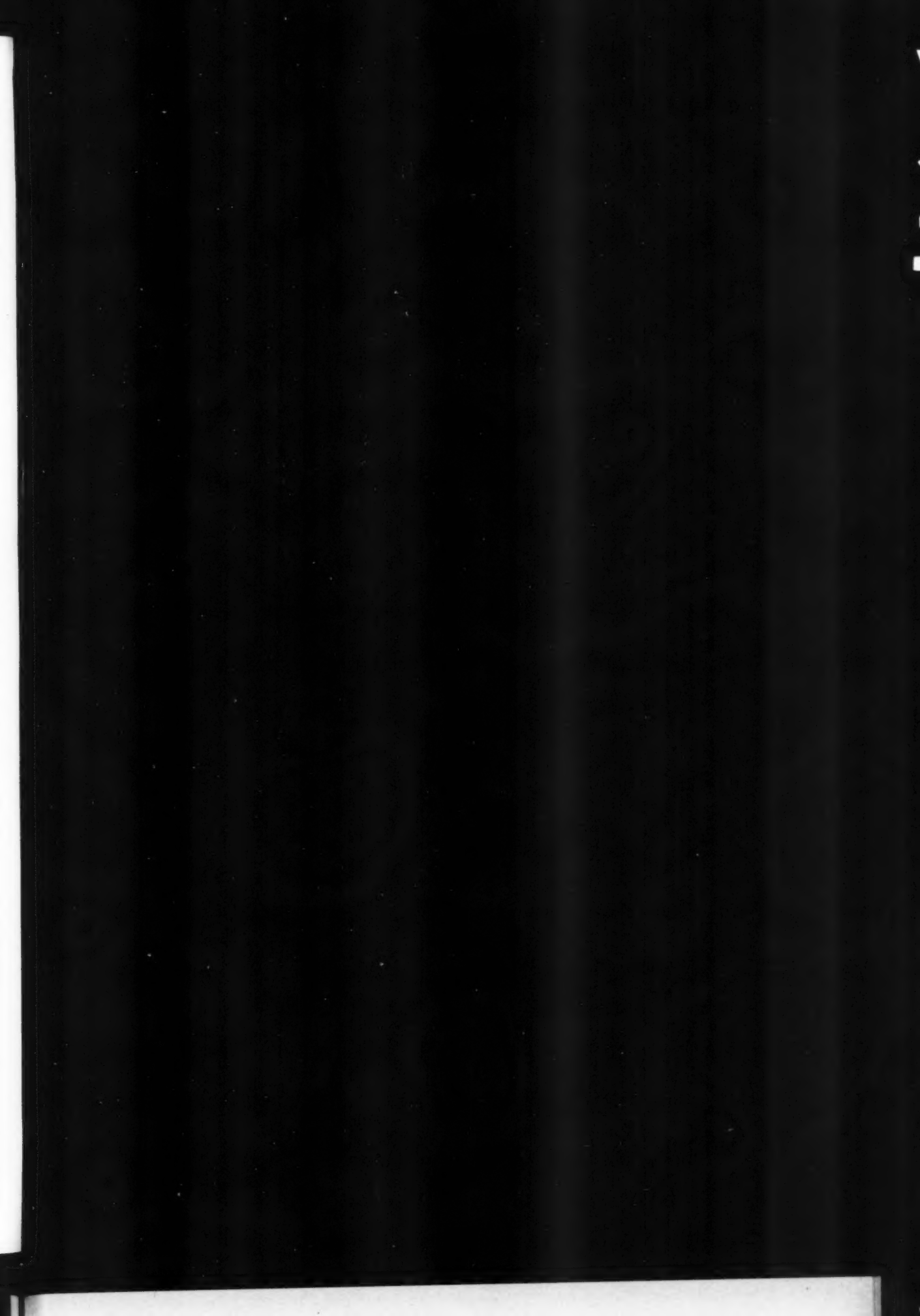

the increased organized fire protection given privately owned land by the various governments. Of last year's fires, 65 per cent occurred on protected lands, while the remainder were on unprotected lands. Of the area burned, however, 67 per cent was without protection, and 33 per cent was protected.

The Forest Service estimates there are 639,540,000 acres of land in the U.S. that should be under organized forest fire protection. Of these, 575,916,000 are protected. The remaining 63,624,000 acres, mostly privately owned, are not under such protection.

B. C. fires unchecked

More than 1,000 fire-fighters were battling some 150 blazes throughout British Columbia. The Forest Service described the situation as "the worst it's been this year."

The three biggest fires, all out of control, were racing through an estimated 7,500 acres of timberland in the Okanagan Valley, the Cariboo, and the Bella Coola Valley. Rangers were keeping a close aerial watch over the rugged area, but reports indicated that it would be impossible to battle the flames from the ground.

In the United States two major fires were burning in mid-August. One near Elsinore, Cal., had already burned over more than 8,000 acres of rugged timber and brush land and had caused the death of one state forestry service worker. Another blaze, this one 25 miles northeast of Bellingham, Wash., had covered 700 acres in two days.

Michigan fires low

In spite of an all-time high in forest fire hazard in the Upper Michigan National Forest this spring, damage has been noticeably low, with few fires reported. According to C. D. Harrison, supervisor in the local forest service office, the 13 fires so far this year have burned only 24 acres. He attributed the good record to a campaign of keeping the public informed of forest fire danger conditions and the need for preventing the blazes. He pointed to the particularly small number of fires in May, when the danger was at its height.

However, the record of fires and damages is not as favorable in the entire upper peninsula, where 227 fires to date have burned about 772 acres. At this time last year 112 fires had damaged only 546 acres. Recent rains have lessened the fire dangers considerably; however, officials fear the late summer and early fall, when dry conditions usually exist in the woods.

Colorado Fire Checked

A stubborn blaze in the Roosevelt National Forest in north central Colorado was put under control June 14 after burning out more than 2,600 acres of timber in four days. Some 600 air force personnel from Warren Air Force Base near Cheyenne aided in the fight. Most of the timber in the area is spruce and lodgepole pine, with a considerable amount of slash timber from previous cuttings.

Wisconsin Uses Radio

Two-way radio has taken the guess work out of fire fighting in Wisconsin. William Meharg of Tomahawk, assistant chief ranger of the state conservation department, described the system at the recent annual meeting of the Forestry Conservation Communications Association at Milwaukee. The state has 10 fixed radio stations, one in each of the protection districts, each of which includes about 1,500,000 acres. The stations dispatch fire fighters and take reports from 120 lookout towers—some equipped with radio and others with telephones.

The service also has 65 mobile radio stations in trucks and 80 pack sets that can be taken directly to a fire. With such communications equipment, the dispatching systems knows exactly how many men and how much equipment is needed at the scene of a blaze. Long delays resulting from lack of contact between men at the fire and headquarters is eliminated.

Washington Losses Low

According to State Forester Bernard Orell at Olympia, forest and brush fires in the State of Washington are far below last year. Through the third week of June 566 acres had been burned, compared with 7,938 at the same time last year. He attributed the low hazard to a well-distributed rainfall, but warned that a few days of dry weather would alter the picture appreciably. Mr. Orell added that beginning on July 1 news of forest closures were to be broadcast by key local radio stations.

Integration Marks Canadian Industry, Theismeyer Tells Conference

"The day of integration has arrived in Canada's vast wood industry," Dr. Lincoln R. Theismeyer told the recent British Commonwealth Forestry Conference held in Montreal. Dr. Theismeyer is president of the Pulp & Paper Research Institute of Canada.

The speaker pointed to firms such as Celanese Corp. of America, which is setting up in British Columbia facilities that include plywood, groundwood, sulphite, sulphate and board mills all under a single management and supplied from one forest reserve on a perpetual yield basis.

The drive toward such integration, he declared, is a result of economic conditions, defense considerations, and legislation to eliminate waste and pollution. He predicted a bright future for the pulp and paper industry, declaring that demand for paper will continue to increase. In this respect, Dr. Theismeyer saw multiwall paper bags replacing bags of cloth or other materials the world over.

Also on the program was S. A. Clarke, chief of the forest products division of the Australian Council for Scientific and Industrial Research, who discussed the advantages of the eucalyptus tree for use as woodpulp. Presiding was Dr. D. A. MacDonald, director of the forestry branch of the Department of Resources and Development, Ottawa. Mr. MacDonald was the first Canadian to be elected head of such a conference.

Colorado Licks Beetles: Outbreak in Northwest

While Colorado officials were heralding the success of their battle against the Engelmann spruce beetle, the U.S. Forest Service was reporting that a similar infestation in Idaho and Montana forests had reached "staggering proportions." James C. Evenden, U.S.F.S. entomologist at Coeur d'Alene, said that a preliminary survey had indicated that as much as 90 per cent of the spruce timber in many areas had been infested and killed in a few weeks.

The sudden end of the Colorado outbreak chopped three years and $10,000,000 off the most optimistic control schedule. Only a few weeks ago U.S. officials were predicting that five years of constant work would be necessary to stop the infestation.

Woodpeckers help

By July 1 officials were convinced they could cut their work in half—thanks in large part to a tremendous invasion of woodpeckers, arch enemies of the beetle deep in the big woods. And recently the forest service announced it would close its last big beetle camp September 1, leaving only two years of "minor mop-up."

Summing up the work in the fight against the insect, Dr. Noel D. Wygant, head of the Fort Collins entomology bureau, declared: "The woodpeckers came through even stronger than we dared to hope, the treatment was more effective than had been indicated, and we got an early start this year in our beetle work. Careful planning and good research paid off, too—we picked the right spots to treat to kill the most beetles."

More than 2,500 men and nearly $4,000,000 have been devoted to the project since 1949. The epidemic had been raging since 1939 without attempt

to check it. This year, the last big beetle stronghold, near Eagle, was wiped up with the spraying of 200,000 trees, and 50,000 more were treated in the Kremmling-Rabbit Ears pass country. The 5,000,000-acre heart of the infestation, centering on Eagle and Kremmling, is virtually under control, and only scattered, fringe mop-up operations will be planned next year.

National Forest Timber Cut Drops Below 1951

Timber cut from national forests totaled 4,418,517,000 board feet during the fiscal year ending June 30, the U.S. Forest Service announced recently. This represents a decrease of 269,763,000 board feet from the 4,688,280,000 cut in 1951.

The drop in the amount of timber taken from the 151 national forests is due primarily to the severe winter and late spring. Deep snows stopped logging operations for several months in the Pacific Northwest and California, two of the heaviest timber-producing regions in the country. The 1952 (fiscal year) timber cut of the East, South and Midwest, on the other hand, showed an increase over the 1951 record.

About 40 per cent, or 1,793,505,000 board feet, of the national forest timber cut came from Washington and Oregon. Second highest producing region was California, where a total of 665,829,000 board feet was taken. The timber cut (by national forest regions) for the year ending June 30 was:

Region 1 (Montana, northern Idaho, northeastern Washington and northwestern South Dakota), 450,166,000; Region 2 (Colorado, South Dakota and eastern Wyoming), 198,284,000; Region 3 (Arizona and New Mexico), 243,652,000; Region 4 (Utah, southern Idaho, western Wyoming and Nevada), 131,310,000; Region 5 (California), 665,829,000; Region 6 (Washington and Oregon), 1,793,505,000; Region 7 (Maine, New Hampshire, Vermont, Pennsylvania, Kentucky, Virginia and West Virginia), 89,220,000; Region 8 (the 11 southern states south of Virginia), 486,636,000; Region 9 (North Dakota, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Ohio and Michigan), 297,502,000; Region 10 (Alaska), 61,892,000, and Tropical (Puerto Rico), 521,000.

Lumberjack in New Role; History Foundation Set Up

The lumberjack is rapidly becoming the new star of America's folklore and history. Writers and historians are showing live interest in forest history. To meet this growing demand for factual information, a national Forest Products History Foundation has been established in St. Paul at the Minnesota Historical Society.

Veterans of the woods have been urged to jot down their memories, round up old letters and pictures, salvage every possible scrap of information that will contribute to preserving the true story of the American forest. Writers are especially eager to have more facts about the colorful "characters" of the forest products industry, how they lived, worked, played, fought and died.

The aim of the Foundation is to permanently preserve the true story of the American forest and to make it known to all Americans. To do that it must depend in large measure on primary historical materials that can be provided only by the men who have been a vital part of forest history. All contributions to the project should be sent to the Foundation at the Minnesota Historical Society Building, St. Paul 1.

Competing Trees Threaten Aspen Future

Michigan's supply of aspen, its fastest growing tree, will be sharply reduced in the next 80 years unless action is taken to prevent the invasion of other trees in the areas where aspen is now growing. This is one of the findings of the Michigan Memorial-Phoenix project now under way at the University of Michigan. The research, financed through a grant made by American Box Board Co. of Grand Rapids, is under the direction of Samuel A. Graham, professor of economic zoology in the School of Natural Resources.

The threat to the future of the aspen tree stems from the fact that it cannot stand competition and will not reproduce itself from seed in sections where other trees get started, or where grass or other vegetation covers the forest floor.

Aspen, ideal for pulpwood, is consumed in growing amounts in Michigan alone. Some evidence of the economic importance of this tree to the Michigan forest industry can be gained from the fact that the Filer City plant of American Box Board spent $1,400,000 last year for pulpwood, all of which was aspen.

More than 300 test plots in state, federal and private forests along the west side of Michigan's lower peninsula have been under observation. There are indications that complete or partial cutting may be necessary to keep a reasonable proportion of aspen in the forests. Virtually all the new growth developing in the test areas is coming from the suckers that grow up from the roots. There is almost no reproduction from the vast number of seeds put forth by the aspen, since a bare, moist soil in the spring is required, and the amount of open ground left in the state is negligible. No problem exists in aspen reproduction in those areas where the tree is now growing by itself with no competition. In these places the trees will be replaced by a stand of aspen suckers following logging. However, the aspen is suffering from invasion by maples and other hardwoods on good soil and by the oak on poorer ground. Here is where action will be necessary to preserve a proper proportion, since the invaders will completely displace the aspen in all of the invaded areas.

Tentative findings indicate three possible steps to keep the aspen alive in areas where it has been invaded: (1) where the invading trees have reached pulpwood size they should be cut along with the aspen to encourage the growth of aspen suckers; (2) where merchantable aspen is mixed with smaller red maples or other species not yet ready for the market, a parcel cut could be made to free the maples and part of the aspen, to be followed later by a clear cutting of the entire area, and (3) where both the maple and aspen are growing equally well, a partial cut of both types could be made for pulpwood purposes, with the remainder left to grow to sawlog size, to be followed by clear cutting.

Cooperating with the university's research group are the Lake States Forest Experiment Station of the U.S. Forest Service, the Michigan Department of Conservation's Forestry Division, and American Box Board. The test plots are to be expanded to include the east side of the lower peninsula.

Forestry Notes

Roaming Bears
are killing thousands of trees in the area around Grays Harbor, Wash. A regional forester has predicted that in some young forests every tree will die. The bears have apparently torn the bark off every tree they have passed in the region.

25,000,000 Board Feet
of timber was cut in the Upper Michigan National Forest in the fiscal year ended July 1. This is a new record. Eighty per cent of the cut was pulpwood, while the remainder was hardwood sawlogs. The value of the cut was $225,000.

Georgia Forestry Commission
is adding a Cessna 170 airplane to its fire-fighting equipment for use as an emergency patrol during the fire season. The plane, to be based at Macon, is equipped with a loud speaker and two-way radio for rapid communication with the men on the ground. A polaroid camera is to be used to make pictures

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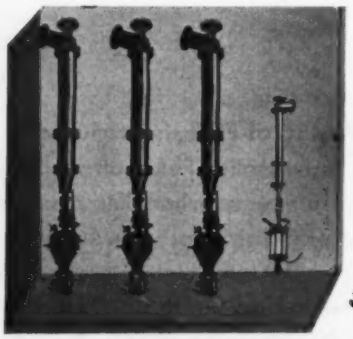

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FOUR COLLEGE SCHOLARSHIPS, the first of a series of awards that the Savannah, Ga., plant of Union Bag & Paper Corp. plans to make annually, were announced recently by T. T. Dunn (center), vice president and resident manager. The scholarships carry a $4,000 cash award each, payable at the rate of $1,000 a year; three of the scholarships should go to sons of plant employees, while one is set aside for a high school student from the county at large. The recipients are (l to r) William M. Gruber, Danny B. Kennedy, Marvin Earl Ellis, Jr. and Robert L. Simmerly; the young men plan to attend the Georgia Institute of Technology

of fire conditions. Pictures can be quickly developed and dropped to ground crews to familiarize them with the fire situation.

Weyerhaeuser Timber Foundation
has established at Yale University a $10,000 memorial fund honoring the late Charles S. Chapman, pioneer forester. The fund will be used for the advancement of industrial forestry through fellowship grants, research, and "such other educational activities that may be designated by the dean of the School of Forestry."

Great Northern Paper Co.
Millinocket, Maine, has announced that its modern conservation methods will insure a supply of pulpwood for at least a century. The firm owns 12 per cent of the total area of Maine, most of it northern timberlands.

25,000 Bumper Tags
bearing the slogan "Stop Woods Fires" have been distributed by the Southern Pulpwood Association. The tags, attached to bumpers by means of a gummed backing, are black and orange. Distribution was made throughout the southern states, both through industry members of the Association and the Southern States Foresters and Extension Foresters.

Disking,
an accepted practice among some managers of pulpwood lands in the Lake States for promoting the regeneration of aspen stands, may also promote the regeneration of other species, according to a report by J. H. Stoeckeler, forester in charge of the Northern Lakes Forest Research Center at Rhinelander, Wis. The study was carried out with the cooperation of Rhinelander Paper Co.

Kalamazoo Mills Tell Efforts to Halt Pollution

CONCLUDING A TWO-DAY MEETING at Milford, Mich., recently, the state water resources commission heard a report on progress being made by paper mills in the Kalamazoo area to halt pollution. Milton P. Adams, executive secretary, reported that there has been some progress toward compliance with the state order to clean up the Kalamazoo River.

Loring F. Oeming, chief engineer of the commission, explained, "Allied Paper Mills is going ahead, but we are not satisfied with what Kalamazoo Paper Co. is doing, because its engineering plans did not provide adequate treatment capacity. However, it is making more tests now."

A letter from Dwight Stocker informed the commission that Michigan Paper Co. has bought the pilot disposal plant buildings constructed on a cooperative basis by mills in the valley. "Our plant will be in operation this summer," he said.

No commission action

No commission action was taken regarding the paper mills. A decision was deferred for one month on Elk Rapids, which has a June 1952 deadline, in an attempt to obtain more information on the status of compliance by the municipality.

Wisconsin Mills Told to "Clean it Up"

The state committee on water pollution at Madison, Wis., announced last month that it plans to tell three paper mills and the Green Bay sewage district to step up their cleanup efforts.

After receiving complaints from the Wisconsin chapter of the Izaak Walton League, the committee asked Director Theodore F. Wisniewski to write Kimberly-Clark Corp. at Kimberly, and Hoberg Paper Mills and Green Bay Pulp & Paper Co., both of Green Bay. Mr. Wisniewski said letters were to be sent to the firms telling them they are not making satisfactory progress in abatement work.

Two firms were praised by the League for cleanup progress in the same area. They are Northern Paper Mills and Consolidated Water Power & Paper Co.

Stream Pollution Outlay Passes $1,000,000

Total outlay of the Sulphite Pulp Manufacturers' Research League at Appleton, Wis., for research to reduce sulphite pollution of the state's streams passed the $1,000,000 mark during June. This was announced by A. J. Wiley, technical director, in his semi-annual report to the group's technical committee. This figure is up more than $70,000 since the end of 1951.

Since its founding in 1939 as a cooperative group to do scientific work on ways to treat or utilize spent sulphite liquor and thus reduce pollution, the League has carried on 34 major projects, Mr. Wiley told the top technical men of Wisconsin's principal sulphite pulp firms. Of these projects, 17 were eventually given up as non-productive, while 17 remain alive. During this 13-year period, the research staff has prepared 121 technical progress reports for member mills; 71 of these reports cover projects still alive and 50 dealt with projects since abandoned.

The largest single group of active research projects on the League's current program consists of seven studies now going forward in the field of applied chemistry. The largest group of reports is 40, covering yeast and other fermenta-

tion processes, which have been under study and test since 1941. Evaporation-and-burning, which became a possibility only after Swedish development of non-scaling evaporator equipment late in World War II, has been the subject of four reports since 1950. The rest of the research reports listed in Mr. Wiley's statement are on various aspects of sulphite liquor technology, including chemical processes, binders and paving uses, and basic research.

League adds equipment

Opening the way for research into new pollution-reducing uses for spent sulphite liquor, the Research League has recently completed installation of major equipment at the Appleton pilot plants.

Added to the research facilities was a vacuum-type drum dryer of commercial type but specially designed for pilot plant and laboratory volume and precision service. Primary purpose of this unit is to prepare dried samples of by-product materials for further research by League scientists and by such potential big-volume users as the principal pharmaceutical manufacturers. The equipment also will be used to dry research samples of materials submitted by the 14 sulphite mills that jointly support the League's cooperative research program.

Stock Car Racing
at the Apple Bowl Raceway near Appleton, Wis., has been improved this year because the higher speeds made possible by the better traction produced by paving the track with sulphite road-binder. Operators of the track spray the oval several times a week with road-binder supplied by nearby paper mills.

Oregon Highway Officials
have announced that Yamhill County is using spent sulphite liquor to lay the dust on gravel roads. The liquid is obtained free-of-charge from Spaulding Pulp & Paper Co.'s mill in Newberg.

Apple Tree Prunings for Cigarette Papers

For the past five years the regional development division in Kelowna, B.C., has been investigating the possibilities of using apple tree prunings to make pulp for cigarette and other fine papers. A Toronto firm has recently perfected a process whereby this high quality pulp can be produced.

Interests in the dry belt area of British Columbia expect eventually to see this as an important industry, with a large plant using all varieties of fruit trees to produce the pulp. It is thought that the result would be a higher quality paper with lower production costs for the paper manufacturers. At present, prunings are bundled and burned at a cost of approximately $3.25 per acre. The estimated price that would be paid for prunings for use in paper mills is $12.50 per ton.

Lower Earnings Seen for Canadian Pulp, Paper Industry

Canadian pulp and paper firms appear to be headed for lower earnings in 1925, according to a survey of semi-annual reports made by the New York *Journal of Commerce*. Boosts in the income tax rate and increased labor costs have been cited as causes of the slump, with the rising value of the Canadian dollar in relation to the U.S. dollar and an abrupt change in world market conditions also sharing the blame. It is expected that the recent $10 increase in the price of Canadian newsprint, undertaken to alleviate somewhat the unfavorable dollar balance, will not be adequate to prevent a reduction in earnings.

"The situation in the first half of 1951," according to the *Journal of Commerce*, "was such that companies producing pulp and other products stood to show higher profits than firms dependent on newsprint income. Now, the pulp, fine paper, and hardboard markets are showing considerable change. Pulp markets traditionally fluctuate considerably in reflecting general business conditions. Last year demand was heavy and prices were higher, but the latest semi-annual reports state that markets have weakened and prices are dropping."

Powell River Co. Ltd., largest newsprint producer on the west coast, has reported that although sales increased in the first half of this year, over-all profits showed a drop of about 14 percent from the same period last year. Fraser Companies Ltd., on the other hand, does not produce newsprint, and its profits slumped 18 per cent.

Minnesota & Ontario Paper Co. had a decline of 6 per cent in profits despite an increase of more than $1,000,000 in sales. Abitibi Power & Paper suffered a 19 per cent drop in net because of the decline in value of the American dollar and higher labor costs. Earning drops were also reported by Consolidated Paper Corp. and St. Lawrence Corp.

W. Canada Researches in Second Growth

With the forest economy gradually shifting from the virgin stands to second growth, western Canada's pulp and paper industry has been devoting much research to the use of such second growth timber in the manufacture of paper.

According to Dr. Ben T. Briggs of the State of Washington, replacement of old western hemlock and Douglas fir with second growth trees has resulted in higher pulp yields, both by unit weight and volume measure. It also produces slightly higher bursting tests, lower tear tests, and higher brightness in bleaching.

Recent tests conducted at the U. S. Forest Products Laboratory have shown an increased yield of usually 6 or 7 per cent for either sulphite of kraft cooking with second growth. Since there is more sapwood in ratio to heartwood in second growth, there is approximately 5 per cent higher yield of paper pulps from this wood. It is approximately the same in the kraft industry.

Sulphur Optimism Unwarranted, Producer Asserts

REPLYING TO THE OPTIMISM shown recently by Langbourne M. Williams Jr., president of Freeport Sulphur Co., Paul Nachtman has predicted that the sulphur shortage will continue at least until 1955. Mr. Nachtman is president of Mexican Gulf Sulphur Co.

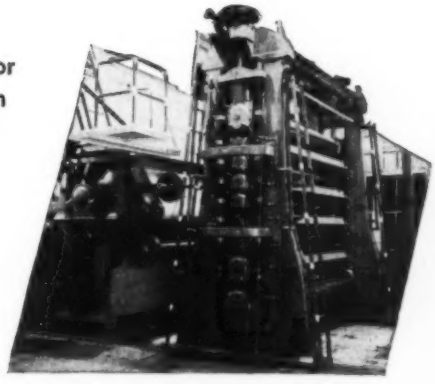
"Sulphur is still in critical short supply in the United States and in the free world," Mr. Nachtman declared, "and will continue to be a problem chemical until at least 1955. After that date the increased United States and Mexican production will alleviate but hardly cure the shortage. It threatens a continuing and vexing problem that will challenge every ingenuity in its solution."

Explaining that the optimism reflected in the newspapers merits closer examination, Mr. Nachtman said that prime defense products require, and will continue to require, vast amounts of the chemical. In many of the producing areas the supply is being rapidly diminished; already extensive conservation, reclamation, recovery and substitution measures have had to be adopted.

A comprehensive evaluation of the long-run prospects for low cost sulphur, Mr. Nachtman continued, is limited at the outset by a lack of knowledge of the size of reserves held by private companies. The amount of salt dome sulphur required to supply 85 per cent of the estimated domestic demand, in accordance with present supply patterns, plus 1,000,000 or more tons in annual exports during the next quarter century would total approximately 180,000,000 tons. Actual reserves of salt dome sul-

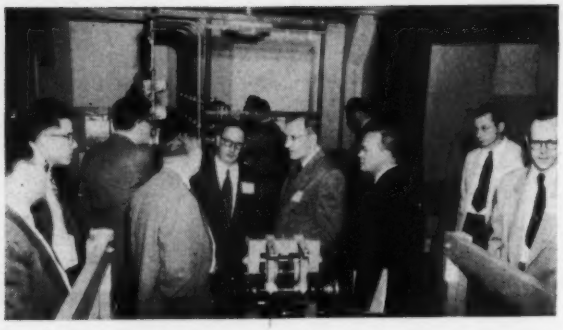
EARLY AMERICAN PROVERB

Today's paper makers have little excuse for trying to make paper competitively on patched-up, make-do, or worn-out machinery, when they could have rebuilt or new machines to simplify their tasks.



RICE BARTON

RB9-52



THE REINFORCED PAPER INDUSTRY was the subject of the first annual Reinforced Paper Conference held in Bedford, Pa. The sponsor was Owens-Corning Fiberglas Corp. Featured was a tour of Owens-Corning's Huntingdon, Pa., plant. In the picture at the left a group discusses a mock-up of a laminating machine demonstrating methods of introducing Fiberglas yarns into reinforced paper; they are (l to r) Fred Shepherd of Ruberoid Co. (facing camera), J. L. Klecka, also of Ruberoid, Bradley Higbee of Adams Paper Co., John Halsey of Albermarle Paper Mfg. Co., and H. C. Crandall of Mosinee Paper Mills Co. At the right the scrim machine is the center of attention; at the far right are S. J. Baisch of Thilmany Pulp & Paper Co. and L. O. Gunderson and W. L. Denman, both of Dearborn Chemical Co.

phur may be double the estimates of the U.S. Geological Survey, or more or less than 100,000,000 tons; but it is unlikely they could support a withdrawal of anything like 180,000,000 tons over the next 25 years.

Mr. Nachtman noted that, although many extensive discoveries have been made recently, past experience has shown that when supply increases in such vital industrial materials as sulphur, demand moves upward at an equal pace.

Government order wins approval

Government relaxation of inventory controls on sulphur was hailed recently by an industry spokesman as "a step in the right direction at the right time."

"The order of the National Production Authority easing the inventory limitation on sulphur from 25 to 60 days should do much to bring about a more normal flow of this vital mineral to the nation's industry," Langbourne M. Williams Jr. of Freeport declared. "It is one more indication that the sulphur shortage of the last two years is virtually over and that there is enough sulphur to meet practically all requirements."

Mr. Williams last month made public figures disclosing that approximately 4,000,000 long tons of sulphur will be added to the free world supply by the end of 1955 as a result of nearly 100 new projects to produce the essential mineral in various forms. (See THE PAPER INDUSTRY for August, page 588.)

New sources

D. W. Ambridge, president of Abitibi Power & Paper Co. Ltd., has announced that a plant to extract sulphur from iron pyrites will be in operation at Port Arthur, Ont., by fall. The plant is now under construction in conjunction with Abitibi's Thunder Bay installation. The pyrites to be burned will be provided by Normetal Mining Corp. at Normetal, Que.

Standard Oil Co. of Indiana has announced that it has started production of sulphur in a new plant at its Whiting, Ind., refinery. The new plant will extract hydrogen sulphide from by-product fuel gases and convert it into sulphur of 99.9 per cent purity.

Shell Oil Co. of Canada will extend the Jumping Pound gas plant, according to W. Ash, president. The new sulphur plant, located 20 miles west of Calgary, began operations early this year and is designed to recover 30 tons of elemental sulphur daily from hydrogen sulphide present in natural gas. Extensions this year will boost natural gas deliveries approximately one-third.

Huge sulphur barge launched

A giant barge bearing a 167-foot insulated tank was launched in Beaumont, Tex., recently. It marks an innovation in shipping molten sulphur. Built by Bethlehem Steel Co. for Coyle Lines Inc., it is designed to transport molten sulphur from Texas Gulf Sulphur Co.'s Moss Bluff mine near Liberty, Texas, to Consolidated Chemical Industries Inc. at Houston.

The tank, which is capable of carrying 1,000 tons of molten sulphur, is similar to a thermos bottle. It has fiberglass insulation that will help maintain an interior temperature of 300F. The cost of the vessel was $160,000.

E. C. Atkins Purchased by Borg-Warner

Acquisition of E. C. Atkins & Co. of Indianapolis, 100-year-old saw manufacturer, by Borg-Warner Corp. of Chicago, was disclosed recently. The company will be operated as the Atkins Division of B-W, according to an announcement by R. C. Ingersoll, B-W president.

More than 1,000 persons are normally employed at the Atkins plant in Indianapolis, which was completed in 1949. The Atkins concern is one of the nation's leading manufacturers of power saws and related instruments for the wood-working and metal-working industries, as well as hand-operated saws of all types. A branch plant at Portland, Ore., is included in the transfer.

Marathon Readies Canadian Caustic Plant

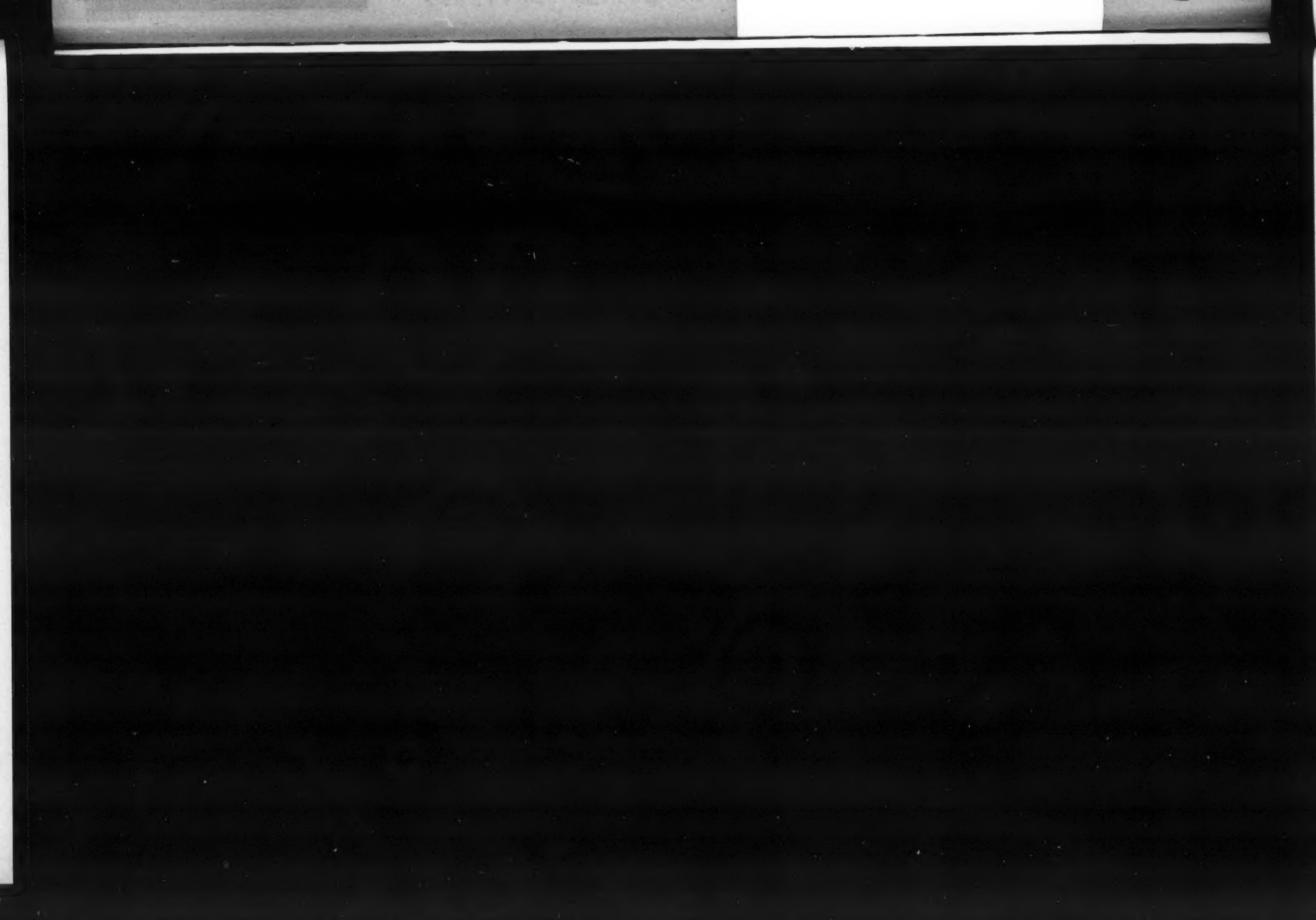
Marathon Paper Mills of Canada Ltd. has predicted early operation for its $3,000,000 plant at Marathon, Ont., for the production of caustic soda simultaneously with sodium sulphite. The installation is said to be the first of its kind in the Western Hemisphere.

Started in 1951 and covering 27,000 square feet, the plant will produce chlorine, caustic, sodium sulphide, and hydrochloric acid. The cell room—the heart of the plant—contains 30 cells, each approximately 4 by 50 feet, with a normal output of a ton of chlorine per day. Two chests blasted out of solid rock measure 1,000 by 30 feet and are 60 feet in depth. They have a combined capacity of 10,000 tons of salt, the main raw material.

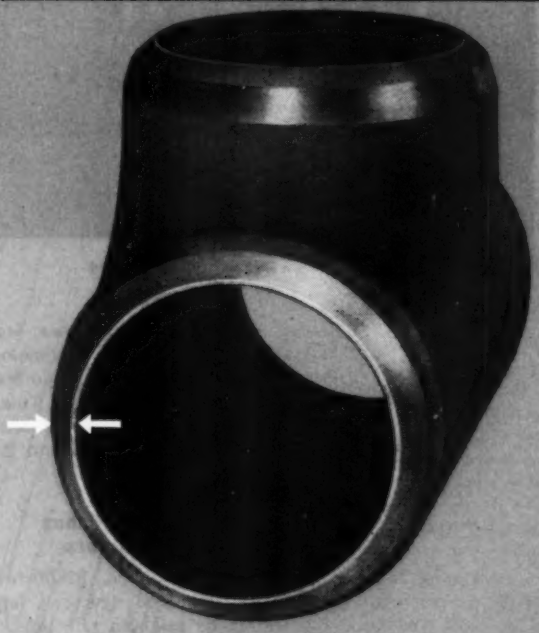
B&W Installs Largest Press for Forming Boiler Plate

Installation of the nation's largest press for forming boiler drum plate and the introduction into America of a method of forming heavy-wall hollow forgings by piercing and drawing an ingot have been announced by The Babcock & Wilcox Co.

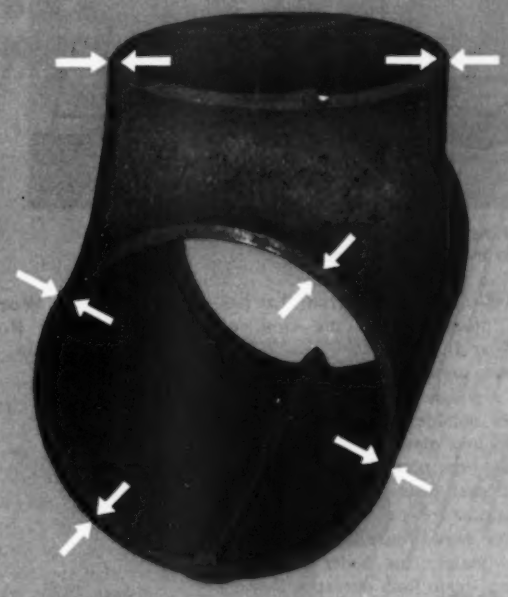
Alfred Iddles, B&W president, said that the mammoth equipment, now in operation at the Barberton, Ohio, works, was an important part of the firm's



EVIDENCE OF SUPERIORITY IN *Corrosive Service*



BEFORE *Midwest 4" extra heavy weight, carbon steel tee showing original wall thickness of tee at right before it was accidentally subjected to corrosive conditions.*



AFTER *When straight pipe in line had failed from corrosion, this Midwest tee was removed. Note amount and uniformity of wall thickness remaining.*

A valve leaked or somebody opened it by mistake . . . so the Midwest Tee shown above was subjected to dilute hydrofluoric acid in addition to its normal service in a 300° F. hydrocarbon line on an alkylation unit.

The highly corrosive acid caused failure of the straight pipe . . . so the entire line had to be replaced. When cut out of the line, the Midwest Tee was found to have a considerable (and uniform) wall thickness. There was no selective corrosion and the weld held up even better than the parent metal.

This was not special alloy made to resist corrosion, but regular Grade "A" carbon steel . . . the same as the new tee shown left above. We do not, of course, recommend carbon steel for corrosive conditions, but, in emergency, it gives good account of itself.

The exclusive Midwest manufacturing process produces fittings of superior metallurgical properties. The metal is worked in compression . . . it is not stretched or extruded, and distribution is uniform. After forming and welding, the fitting is stress-relieved. For further information, write us for a copy of Catalog 48.

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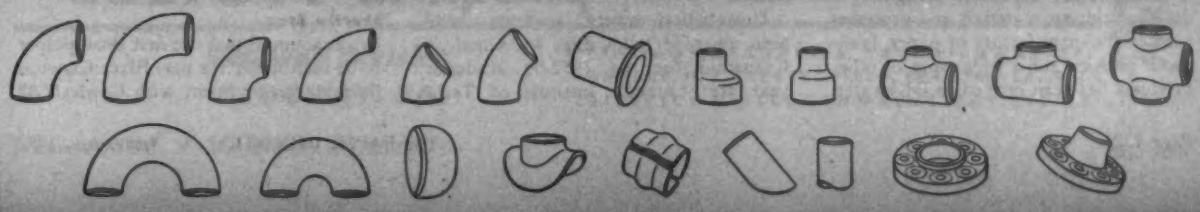
IMPROVE DESIGN AND REDUCE COSTS



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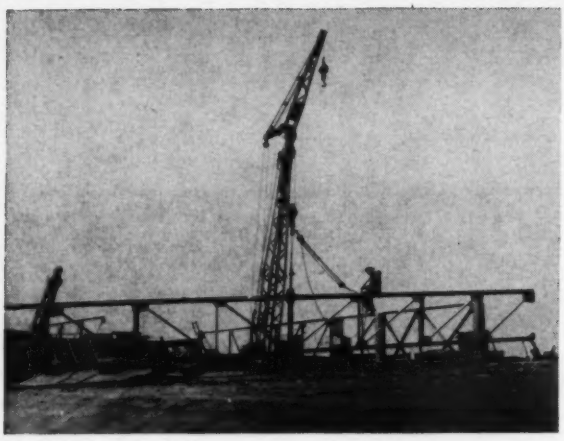


ROOF OPENING and crawler crane in heart of Beloit Iron Works plant

LEVELING ROOF TRUSS just lifted through opening in old roof

$30,000,000 expansion program that has been in progress since the close of World War II.

The new press and draw bench will produce a rough hollow forging up to 35 inches outside diameter with 4½-inch walls in a matter of minutes. Until now it has been necessary to make such pieces of steel plate rolled and welded at the seam or from a solid forging with the center bored out. These forgings are used mainly for boiler parts and connecting steam lines operating at high temperature and pressure.

Chicago Testing Laboratory Forms New Division

A specialties division for the purpose of extending the scope of its activities has been opened by Chicago Testing Laboratory. Housed in a new laboratory, the division will undertake problems relating to pulp, paper, paperboard, metal foils, plastic films, food stuffs packaging, and chemicals used in papermaking and converting operations.

Routine testing and control and development problems will be within the scope of the laboratory's activities. The equipment includes a constant temperature and humidity conditioning room and most of the specialized apparatus required to test papers, by methods standardized by Tappi, ASTM, and federal specifications.

The specialties division is under the supervision of Arthur C. Dreshfield, who has been associated with the paper and allied industries for more than 30 years. The Chicago Testing Laboratory is headed by Gene Abson.

Barrett Inaugurates Research Laboratory

A laboratory especially designed to develop and test materials and processes used in the manufacture of paper, laminates, plastics, and a wide range of other products has been opened in Edgewater, N. J., by Barrett Division, Allied Chemical & Dye Corp.

The laboratory is to be known as the Shadyside Applications Research Laboratory and will be in charge of D. A. Rankin. Containing extensive testing and actual production equipment, including mills, presses, calenders, extruders, molding machines and other special facilities, the laboratory will enable Barrett technicians to develop, test, and evaluate, under simulated production conditions, various Barrett materials.

American Cyanamid Continues Grants and Fellowships

American Cyanamid Co.'s program of grants and fellowships to universities this year included 17 graduate fellowship awards in chemistry and chemical engineering. The fellowships were awarded to graduate students in their final pre-doctoral year of study and carry a stipend of $1,500 plus full tuition and incidental laboratory fees. They also included $300 for unrestricted use by the department of chemistry or chemical engineering of the student's school.

Universities where students have been awarded fellowships by American Cyanamid for the 1952-53 academic year are: Carnegie Institute of Technology, Columbia, Duke, Iowa State, Massachusetts Institute of Technology, Princeton, Purdue, Stanford, Ohio State, Pennsylvania State College, Tulane, University of Colorado, Illinois, Michigan, Minnesota, Washington, and Wisconsin.

Beloit Iron Works Installs New Roof

Beloit Iron Works at Beloit, Wis., was in the process during July and August of installing a new roof at their huge plant. During the operation, construction of paper mill machinery continued on schedule.

Two huge crawler cranes in the very heart of the plant lifted roof trusses (some 63 feet long and weighing 2½ tons) through an opening only 48 feet in length. Then came the hard part—maneuvering the trusses gently into place directly above the old roof.

Black-Clawson Establishes New Southern Quarters

The Black-Clawson Co., Middletown, Ohio, has established new and larger quarters for its southern sales office in Atlanta. The new address is 685 West Peach Tree St., Atlanta 3. The former location was in Decatur, Ga.

The branch office was opened in July 1950 to provide immediate sales and engineering service on the complete line of Black-Clawson, Shartle, Dilts papermaking and converting machinery to pulp and paper mills. Edward M. Root is southern sales manager, while Fred C. Jones, sales engineer, serves as his assistant.

Allied Notes

Monsanto Chemical Co.,
St. Louis, has reported that its research into the possibilities of making vanillin from lignin has proved successful. As a result, the new plant in Seattle and expanded facilities at St. Louis have been linked in lignin production. The firm also has announced the start of construction of a phenol plant at Avon, Cal., with completion set for 1954.

Copes-Vulcan Division
of Continental Foundry & Machine Co., Erie, Pa., has appointed Carl Grimes & Co., Des Moines as representatives in the state of Iowa.

Shartle Bros.
has announced that the first Beatapulper to be built under the new Black-Clawson licensing arrangement with Cowles Co.,

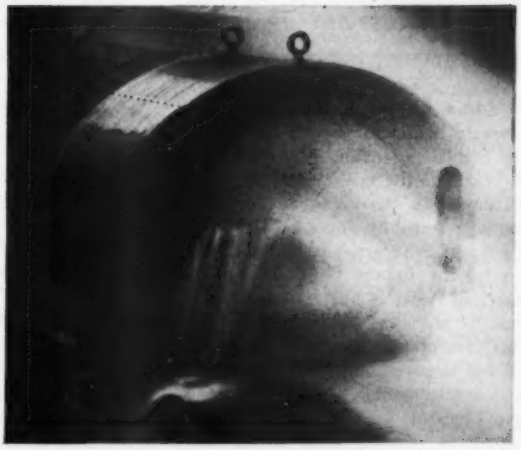
No roof needed with the ELLIOTT OUTDOOR SPLASHPROOF MOTOR

Elliott FABRI-STEEL MOTORS AND GENERATORS

SAVE THE COST OF HOUSING for motor-driven pump units, by using motors that supply their own housing—protecting against wind-driven rain, mist, dust, sand, snow, or sleet. Motors you can set up outdoors, wherever is most convenient for the work they have to do.

Elliott "Fabri-Steel" construction permits motor design ideally suited to the need, providing the rigidity, crack-proof strength, and rugged endurance which combine with other Elliott refinements to produce a motor outstandingly dependable, no matter what the duty or conditions. It's a natural for any drive.

Available from third size above NEMA frames and larger. Write for bulletin on the motor you need.



The Elliott Outdoor Motor has gone over big. It's the direct answer to the present high cost of building pump houses and other expensive protection for motor-driven equipment.

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Ridgway Division
RIDGWAY, PA.

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Plants at: JEANNETTE, PA. • RIDGWAY, PA.
AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES

Cayuga, N.Y., has been installed at the Miamisburg Box Board Division of Interstate Folding Box Co. at Miamisburg, Ohio.

Goodyear Tire & Rubber Co's.
chemical division at Akron, Ohio, has announced production of two new latices of special interest to paper converters. The new products are designated as Chemigum Latex 235BHS and Chemigum Latex 245CHS.

Oliver United Filters
announces an arrangement for local direct sales and engineering representation in the following southern states: Florida, Georgia, South Carolina, Mississippi, and Louisiana.

Graver Water Conditioning Co.
has doubled the space of its main offices at 216 W. 14th St., New York, N.Y. The firm, a division of Graver Tank & Mfg. Co. Inc., has enlarged all departments, and additional departments, including Research and Product Development, Field Service, and subdivisions of the Engineering Department, have been created to extend the firm's facilities.

Quaker Rubber Corp.,
a division of H. K. Porter Co. Inc., Philadelphia, has established a branch warehouse and sales office in Cincinnati.

Worthington Corp.,
Harrison, N.J., has inaugurated a new placement program for recruiting and training college-graduated engineers with the signing of 52 engineers. The project is part of a newly created Personnel and Training Department. The new section absorbs the functions of the company's former Sales Personnel Division and embraces recruitment, training, education, and development of new technical personnel for all branches of the firm, including sales, manufacturing, accounting, purchasing, and engineering.

Consolidated Engineering Corp.,
Pasadena, Cal., has announced the formation of a new corporation, CEC Instruments Inc., as a subsidiary organization to handle sales and service work on Consolidated-manufactured instruments.

USE OF GAS for paper mill drying was discussed in New York, N. Y., June 26 by gas and equipment manufacturers; some of those attending the meeting took time out for a cruise on the *Debris II*, owned by F. G. McGlaughlin, president of Red-Ray Mfg. Co., Inc.

Customs Court Cases

Nearly 50 cases in which undervaluation had been found by reason of a difference in the conversion of foreign currency into American dollars have been abandoned by importers, according to a report by Warren B. Bullock, manager of the Import Committee of the American Paper Industry. The cases include 37 shipments of novel news and other groundwood papers from Canada, and one sheathing, two bible, three simplex decalcomania, and two drawing from England.

Customs officials have acted on a variety of classification problems that have come before them. All the following decisions involved imports at New York, N. Y., except those otherwise specified: cosmetic wrapping paper from England classified as uncoated paper with a surface design at 4½ cents per pound and 10 per cent, not as metal coated paper at 2½ cents per pound and 10 per cent; rag and paper base for use as a base for linoleum classified at 10 per cent as sheathing paper, not duty-free as paper stock; multiwall bags imported from Canada classified by Cincinnati officials as manufactures of paper at 17½ per cent, not as manufactures of reinforced paper; rejected plaster board liner returned from Canada, classified by Buffalo officials for duty as paperboard, not duty-free as paper stock; corrugating stock of soft screenings from Canada classified by Boston officials as paper not specially provided for at 30 per cent, not admitted as kraft wrapping paper at 10 per cent; shoe board imported through Boston from Sweden classified for duty as shoe board at 10 per cent, not admitted at the 5 per cent rate for fibreboard; tag board imported through Port Huron, Mich., classified for duty at 30 per cent as paper not specially provided for, not printing paper as claimed by the importer.

Paper with groundwood content, entered as bond paper, was classified for duty at the lower rate for printing paper on the advice of the Import Committee, which could not justify a classification as writing paper.

Bagasse Paper Imported

For the first time in history paper made from bagasse has been imported into the United States. The shipment came from Peru through New York, N. Y., according to Mr. Bullock. The paper was entered as a printing paper, but because of its character is being studied by Customs officials to determine its proper classification for duty purposes. While the price of the paper is reported to be far above that for standard newsprint, two New York newspapers are said to have made experimental tests to determine its usability.

Meanwhile, representatives of the W. R. Grace Co., international trading and industrial firm that has participated in the establishment of South American mills to use this waste of sugar cane, staged a press conference and display of its papers in New York. The purpose of this display was primarily to promote the sale of royalty rights for the use of the Peruvian process in this country. Hitherto, imports of bagasse products have consisted of paperboards and corrugating stock.

The U. S. Customs Court has held that a 50-50 per cent mixture of sulphite and groundwood pulps is duty-free as paper stock. Industry witnesses, supporting the Customs classification of the material as a non-enumerated manufacture dutiable at 20 per cent, testified that such a mixture is a product of two processes for pulping wood and is not the pulp of commerce. The Court conceded that the mixture was not duty-free as pulp but held further that it is duty-free under another paragraph of the Tariff Act as paper stock.

New cases coming before the court include the following: wrapping paper with 10 per cent groundwood claimed to be dutiable at 10 per cent as kraft wrap-

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SAVES VALUABLE FLOOR SPACE IN QUALITY SCREENING OPERATIONS

The Lindblad Screen is designed to enable your mill to have high-quality screened pulp at lower operating cost.

In order to achieve high-quality screening operations, the Lindblad incorporates such characteristics as--

A positive oil-lubricating system
Twelve sectionalized cut plates
Bottom feed inlet box and tailings outlet for sub-floor piping
Self-cleaning ability
Low power and water consumption
High capacity
Space-saving ability
No concrete damping block required

These distinguishing features earn for the Lindblad Pulp Screen a definite place in your mill.

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IMPROVED PAPER MACHINERY CORPORATION

NASHUA, NEW HAMPSHIRE

Sherbrooke Machineries Limited manufacture similar equipment in Canada

ping paper, classified for duty by New York officials as other wrapping paper at 12½ per cent; chemical test paper imported at Chicago from Canada claimed to be dutiable as tissue paper, but held by officials to be dutiable at the higher rate of duty for manufactures of paper.

Customs officials are reported to have decided on the classification of several importations of foreign papers. Included are the following: two types of cover paper—plain and embossed, imported at San Francisco from Germany and classified as cover paper at 15 per cent when plain, but as surface decorated paper at 4½ cents per pound and 10 per cent when embossed; carbonized paper weighing more than the allowable maximum for carbonizing tissue, imported from England and classified for duty at the higher rate of 2½ cents per pound plus 7½ per cent as coated paper; German paper claimed to be drawing paper, classified for duty at the higher rate for bristol; unmutilated newsprint side runs classified for duty as printing paper, not admitted duty-free as paper stock; nine-point kraft from Sweden for corrugating, classified for duty at 30 per cent as paper not specially provided for, not admitted at 10 per cent as kraft wrapping paper; elephant hide paper for bookbinding classified for duty as coated paper at 2½ cents per pound and 7½ per cent; towel stock from Canada, in 250-foot 10-inch rolls, classified for duty as machine creped paper, not at the lower rate claimed for paper cut into shape.

Six-Month Production Down from 1951

Paper and paperboard production for the first six months of 1952 totaled 12,044,892 tons, down more than 1,680,000 tons from the 13,733,501 tons produced in the similar period last year. The figures were released by the American Paper & Pulp Association.

Orders received in the six-month period totaled 11,901,670, down almost 2,000,000 tons from last year. Orders for the second quarter were down more than 1,100,000 tons, with production for that period lower in proportion.

Showing a gain was newsprint, with a six-month output of 565,055 tons, compared with 549,421 last year. The biggest slump was in paperboard, where production was 5,178,584 tons, against 6,434,641 last year.

Wastepaper receipts for the first five months were 3,178,000 tons, a decline of 26 per cent from the like period in 1951. Consumption declined 22 per cent.

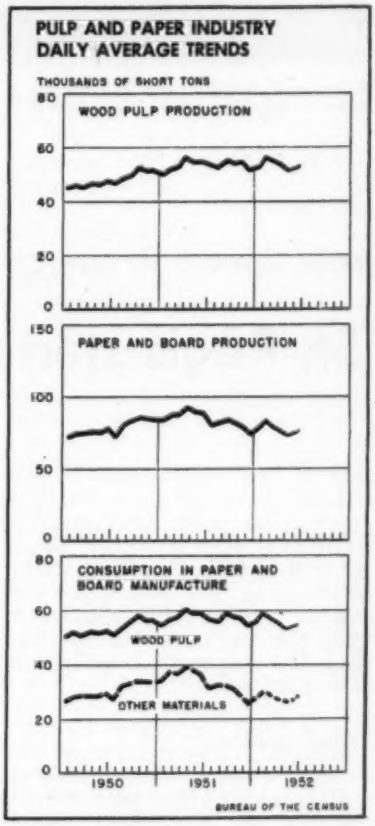
U. S. Paper and Paperboard Production

	June 1952 (tons)	May 1952 (tons)	June 1951 (tons)	Total 1951* (1,000 tons)	Total 1946
Paper and Board, total	1,950,897	2,010,553	2,282,482	26,086	19,278
Paper, total	868,688	915,827	978,636	11,622	8,752
Newsprint	93,546	98,800	93,899	1,106	773
Groundwood paper (uncoated)	63,203	68,998	65,793	789	776
Printing and converting (coated)	91,620	93,937	93,779	1,115	486
Book paper (uncoated)	123,824	125,378	125,611	1,622	1,447
Fine paper (writing, cover and text, bristols, thin paper, and other)	100,872	115,790	117,902	1,364	1,160
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment, and other)	251,055	269,058	305,533	3,597	2,690
Special industrial paper	35,228	31,931	37,531	419	272
Sanitary paper	84,333	87,233	107,066	1,215	861
Tissue paper	15,833	15,444	21,138	270	184
Absorbent paper	9,174	9,258	10,384	124	103
Paperboard, total	846,824	863,591	1,042,438	11,605	8,396
Containerboard, total	452,093	460,681	568,907	6,347	4,315
Liners	303,920	307,324	369,034	4,205	
Corrugating material	123,606	130,233	167,553	1,815	
Container chip	24,567	23,124	32,320	328	
Bending board (folding boxboard)	249,420	256,779	304,297	2,429	2,317
Non-bending board (set-up boxboard)	57,915	58,237	83,676	701	521
Cardboard	5,915	6,185	7,371	79	89
All other paperboard	80,681	81,709	78,187	2,049	1,154†
Wet machine board	11,770	11,832	12,498	144	138
Construction paper and board, total	224,415	219,303	248,910	2,716	1,992
Building paper and insulation	114,266	113,596	125,771	1,401	1,036
Hardboard and insulation board	110,149	105,707	123,139	1,315	956

(*) Preliminary report. (†) Includes bending and non-bending board not for use in box plants. *Source: U.S. Department of Commerce.*

June Pulp, Paper and Board Production

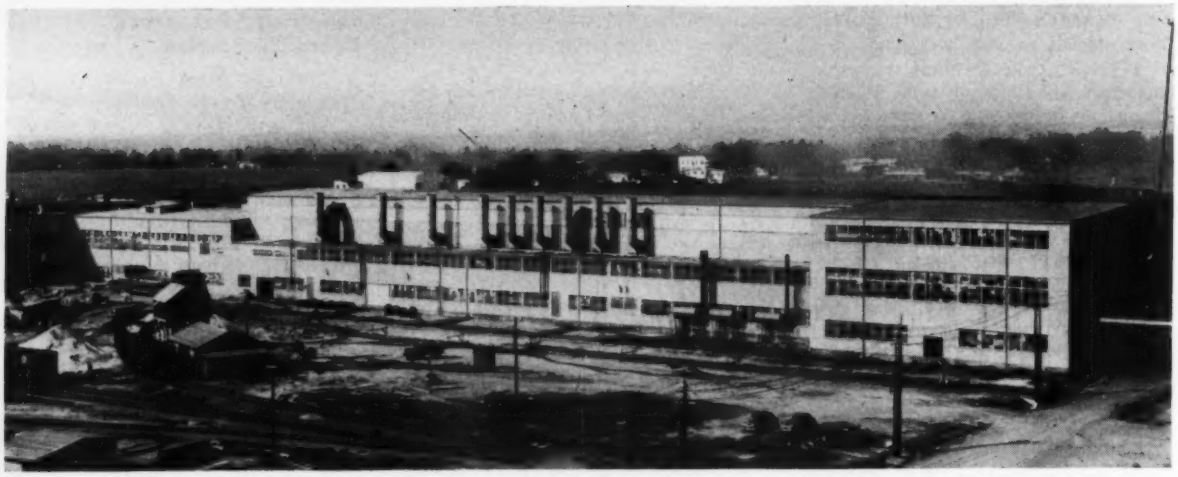
Paper and board production during June amounted to 1,950,897 tons, according to a report released by the Bureau of the Census. This is 15 per cent less than the tonnage produced in June a year ago. In terms of production base capacity, the industry operated at 72.9 per cent in June, with the paper and paperboard sections operating at 77.9 and 67.6 per cent, respectively. The comparable ratios for May were: Total, 69.7 per cent; paper, 76.2 per cent, and paperboard, 64 per cent.



Pulpwood receipts at the pulp mills during the month were 2,046,664 cords, with consumption at 2,130,139 cords. Month-end inventories decreased about 2 per cent to 5,148,712 cords.

Wood pulp production during June amounted to 1,331,662 tons. In terms of production base capacity, pulp production ran at 81.6 per cent, as compared to 79.8 per cent in May.

Wood pulp inventories at the end of June at the paper and board mills were 552,403 tons, as compared to 556,901 tons reported at the end of May. Month-end stocks at the pulp mills increased from 136,116 tons to 147,714 tons.



Extension of machine room to house No. 4 machine; adjoining the bag factory at the left is the expanded finishing, storage, and shipping room; to the extreme right is a portion of the piping for pulp movement

Major expansion at "Kraft Center" completed as . . .

St. Regis starts new machine at Pensacola

WITH THE FIRST PAPER PRODUCED on the new No. 4 machine on April 5, the major expansion of the kraft pulp, paper and board capacity of St. Regis Paper Co.'s "Kraft Center" at Pensacola, Fla., was largely completed. The expanded facilities of the pulp mill and the power department had been completed and in operation before that date.

Paper machine

To better meet the demands for the various grades of paper and board products that the new machine might be expected to produce and to provide as much flexibility as possible for making a broad range of grades, a paper machine both wider and with more dryers than the original No. 3 machine was selected. Maximum speed is 2400 feet per minute.

The paper machine, built by The Bagley & Sewall Co., Watertown, N.Y., is a fourdrinier with a wire 228 inches wide and 120 feet long for the fourdrinier section, which is equipped with a 28-inch diameter breast roll and a 44-inch diameter couch roll. Panelyte covered stainless steel forming boards, rubber covered wire rolls, 10 Panelyte covered stainless steel suction boxes, mounted on stainless steel clad box section frames, arranged for shake from three shake units, motor driven. The entire fourdrinier frame may be supported cantilever-wise from the backside of the machine by four hold-down positions to enable drawing on a wire that has previously been draped in position on carriages and supports in the tending aisle.

Ahead of the fourdrinier section is provided a pressure type inlet and hydraulic nozzle slice with perforated rolls and drives, combined with a flow spreader, all of stainless steel and stainless-clad steel construction, furnished by Pusey & Jones Co. of Wilmington, Del.

A 30,000 gallon per minute centrifugal pump, furnished by Ingersoll-Rand Co., driven by a Westinghouse Electric Corp. 300 hp, 400 rpm synchronous motor through an Electric Machinery Mfg. Co. magnetic drive coupling, permitting adjustable speed of the pump and controlled through a magnetic amplifier speed control, provides for the delivery to the fourdrinier section through the pressure inlet and slice arrangement the 0.2 to 0.25 per cent stock suspension liquid in amounts to suit the demands of the machine.

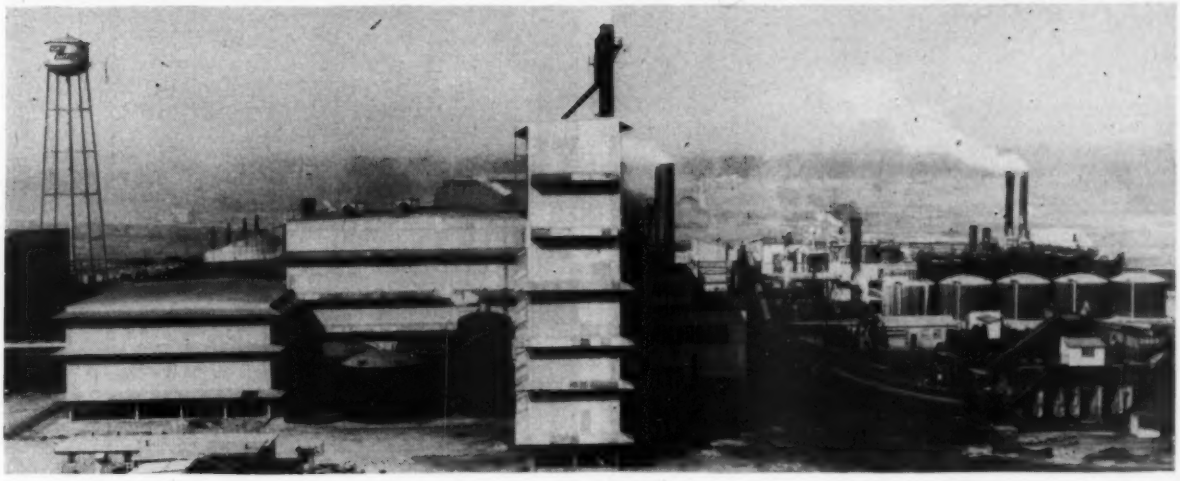
Press section

The press part of the machine, which follows the fourdrinier section, consists of two sets of heavy type housings for 36-inch diameter, rubber covered suction bottom press rolls, arranged for straight through operation without reversing, for which the 30-inch diameter top press rolls are provided with a Stonite cover for the first press and a rubber cover for the second press. The top rolls are equipped with hydraulic cylinders for pressure and lifting.

A 22-inch diameter Neoprene covered lump breaker roll, with cylinders for hydraulic lift and pressure, and an 8-inch rubber covered draw roll with cylinders for hydraulic lift, are supported from the press part frames and arranged for independent gear motor drives.

A stainless steel save-all pan, 15-inch diameter, rubber covered felt rolls, a Panelyte covered stainless felt suction box, a shower pipe, and a Vickery felt conditioner with four jordan-type shoes are provided for each of the two press and felt sections.

To provide for the water and air removal requirements of the suction couch roll, the two press rolls and the flat boxes, there are located on the ground floor of the mill eight vacuum pumps, made by Nash Engineering Co. and furnished through Clark & Vicario Co., as follows: for the couch roll—two H-12-A pumps; for the two press rolls—two H-11-A pumps; for the flat boxes



View of new construction at No. 2 Pulp Mill, with conveyor from the barking drums to the chippers (right); lime recovery installation (background), and 150-foot water tower for fire protection (left)

—one K-9 pump; for the felt conditioners—one K-6 pump, and for the felt boxes—one K-7 pump. An additional H-12-A pump is so located and arranged with piping that it may serve as a booster pump for any one or all of the couch, press roll, or flat box suction systems. All of the pumps are individually motor driven through a Texrope drive. Maxim silencers have been installed on the discharge lines from the Nash pumps.

Following the press section of the machine is a smoothing press, consisting of a Stonite bottom roll, and a rubber covered top roll, each 30 inches in diameter, mounted in a box section type of frame in conjunction with the dryer framing. Pressure loading is applied by hydraulic cylinder.

Dryer section

The dryer section of the machine consists of 70 paper dryers and 18 felt dryers, all 60-inch diameter by 226-inch face, arranged in four sections with four indriving shafts. Dryers are arranged as follows: First and second sections—20 paper dryers, four Feeney felt dryers, and two conventional felt dryers.

A breaker stack, consisting of 30-inch diameter top and bottom rubber-covered rolls, is located between the second and third dryer section. The third section consists of: 19 paper dryers, two Feeney felt dryers, and two conventional felt dryers.

A size press, consisting of rubber-covered bottom roll and white Stonite top roll, each 30-inch diameter, is located between the third and fourth dryer sections. The top size press roll is independently driven by a motor reducer unit and arrangement of gears. The fourth section consists of 11 paper dryers and two conventional dryers.

All the dryers, which were designed and tested for 75-pound steam pressure and 150-pound water pressure, are equipped with anti-friction bearings. An enclosed type design of dryer gears with teeth of special helical form are located between the dryer face and the bearings, using small diameter gears on the dryers with intermediate idlers.

A complete Bowser circulating oiling system with supply tank, pumps, filters, and regulating equipment, has been installed on the ground floor of the mill for the bearings and gears of the dryer section and bearings of the calenders.

Lodding doctors are provided on the first and last dryers of each of the four dryer sections. The entire dryer section is equipped with a Sheahan automatic rope paper carrier.

All the automatic felt guides and take-ups for the dryer section, the automatic felt guides for the press sections and the wire guide for the fourdrinier are hydraulically operated, mechanically controlled.

The machine has been equipped with a Midwest-Fulton condensate removal system and a Foxboro pressure drying control on all four sections of dryers, with Stamm moisture control system provided also for the first and third dryer sections.

Roy K. Ferguson
President and board chairman

Wm. R. Adams
Vice president
pulp and paper

Edward R. Gay
Executive
vice president

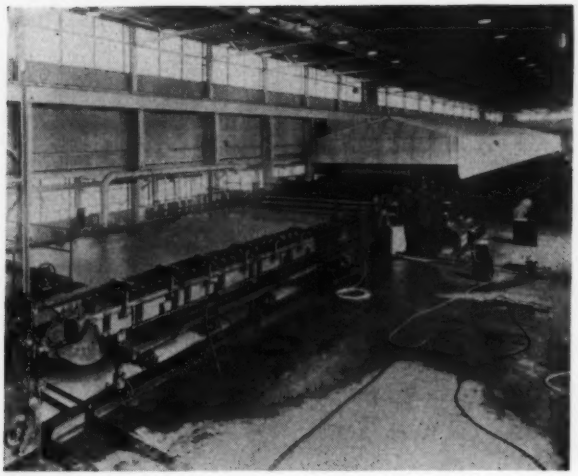
Calenders

There are two stacks of calenders with open end type housings, each with eight Farreloy rolls and Lodding oscillating doctors, arranged for the rolls to come out sideways. The king roll in each of these stacks is 34-inch diameter by 220-inch face and weighs about 30 tons.

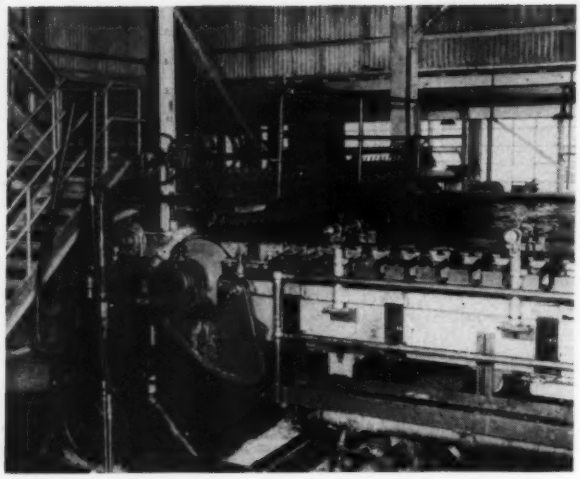
A Beloit standard type board reel follows the calenders and is capable of producing as a maximum a reel 76 inches in diameter.

The unwinding stand, designed to receive the large reels of paper and provide for alignment adjustments, is arranged for regenerative braking, and, in addition, equipped through solenoid-operated shoe brakes to stop a large reel at top speed within about 10 seconds.

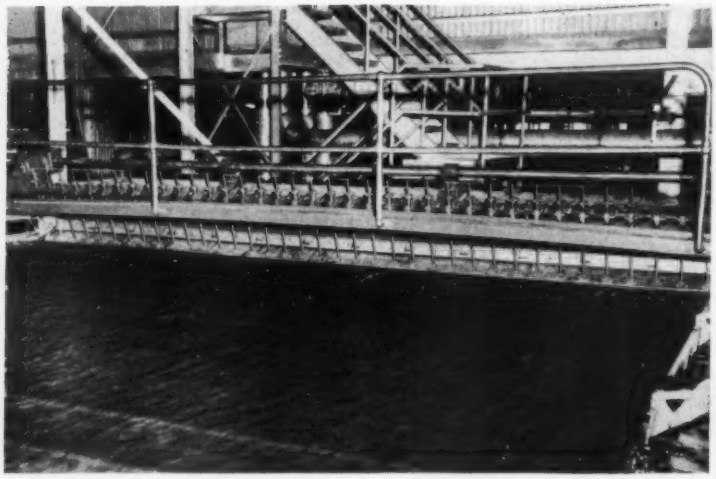
The winder, which has been especially designed and built by Bagley & Sewall for this machine to wind 62-inch maximum diameter rolls and to run at maximum speed of 5000 fpm, is furnished with two 18-inch diameter rewind drums, individually motor driven through V-belt drives; air operated score cut slitters; power driven rider roll lift and a hydraulic operated unloading table, which lowers the rolls to the floor. All operating mechanism is hydraulic, and cylinders, counter-weights, sprocket,



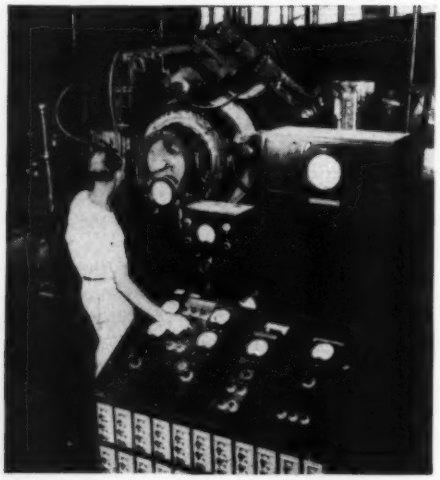
Paper machine as seen
from wet end to dry end



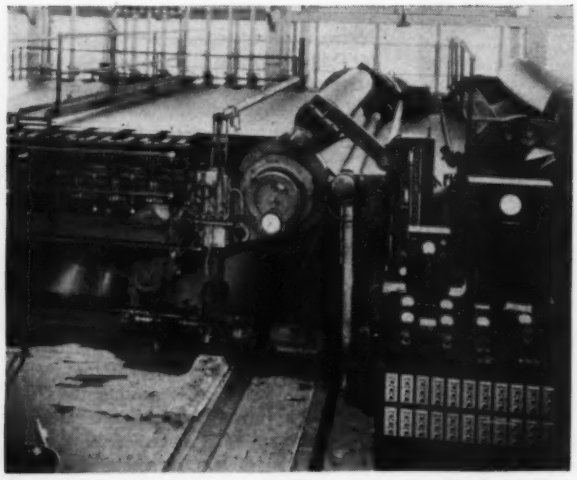
Slice at wet end,
showing control for pulp flow



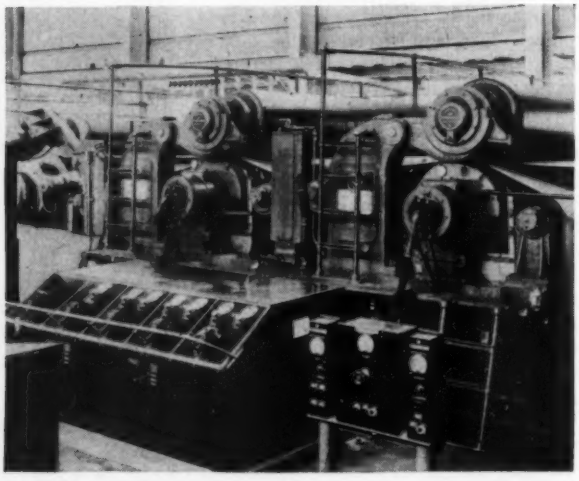
Pulp flowing out on fourdrinier from slice
at wet end; note lack of head box



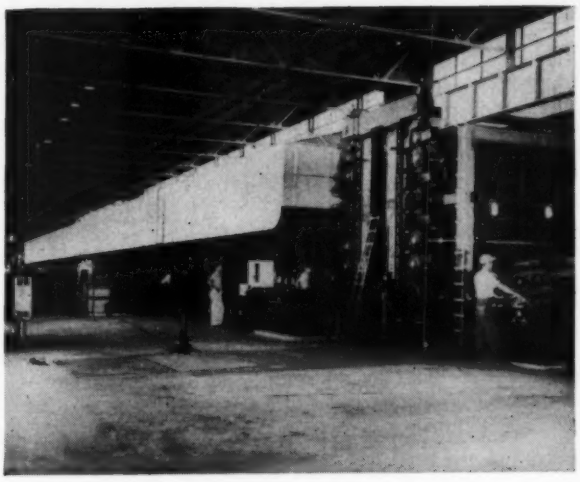
Machine tender's
wet end control panel



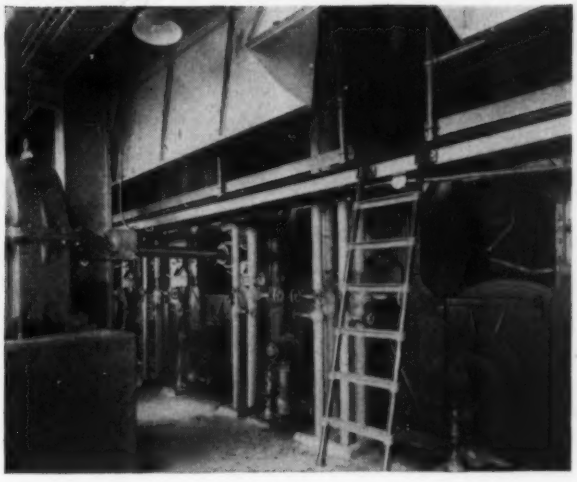
Suction couch roll
on fourdrinier, note controls



Nos. 1 and 2 presses
and console control panel board



General view of No. 4 machine from dry end



Dryer section gearing (enclosed)

chains, etc., involved are enclosed within the heavy box type side frames.

The paper machine is designed and built for a maximum speed of 2400 feet per minute. Practically all the rolls are provided with anti-friction bearings.

A 6-ton fixed hoist overhead traveling crane, specially designed to fit within limiting clearances of life and travel, is provided over the area between the reel and the winder. This crane is electrically operated and controlled and was furnished by Euclid Crane & Hoist Co. to transfer by means of a yoke the paper reels from reel to unwinding stand and to return empty reel spools to reel.

The box girder bridge section of the electrically operated overhead, two 15-ton trolley hoist crane, originally installed over No. 3 machine, was extended in length by splicing a girder section in it, as planned when the crane was originally installed, to span over the two paper machines in the extended machine room building. This extension was furnished by Shaw Crane Division of Manning, Maxwell & Moore Inc., who supplied the original crane.

A hood and exhaust system for the dryer section, a Ross-Grewin system, and a roof heating and ventilating system for the extended machine room, was designed and furnished by J. O. Ross Engineering Corp. A Transite panel hood about 240 feet long with side curtains of Transite panels, which was erected over the dryer section of the machine, has nine exhaust outlet sections to 60-inch B. F. Sturtevant Axiflo type fans, motor driven through V-belt drives, located on the roof over the drive aisle.

A broke beater with a roll 64 inches in diameter by 48-inch face and a metal tub, furnished by Shartle Brothers Machine Co., located on the ground floor under the machine near the reel and winder, provides for handling all the dry broke and shavings from the dry end of paper machine and winder.

Machine drive

The paper machine is driven by a Westinghouse sectional electric motor drive with automatic control and electronic speed regulation. The power supplying motor-generator set, consisting of a 3,000 hp synchronous motor, 2300 v, a 2,000 kw dc generator 600 v, and a starting generator together with the exciter sets, speed regulating equipment, ventilating blower, ac and dc control switchboard, and the 250 hp motor generator set for the winder drive are located in an enclosed room on the ground floor of the machine room under the drive midway of the dryer section.

A building extension to the original machine room building 44 feet wide by 396 feet long houses all the added papermaking equipment and facilities except the winder and unwinding equipment, which had to be located in the building extension of the finishing room (44 feet by 144 feet).

Added equipment in the finishing room consists only of one Toledo built-in floor scale, with 9- by 7-foot platform, and an 8-ton capacity freight elevator with 14- by 10-foot platform, furnished by Otis Elevator Co.

In an extension to the stock preparation building, 71 feet wide by 110 feet long, is located the refining equipment on the operating floor level, with the stock chests, pumps, agitator drives, etc., on the ground floor below.

Refiners

There are two lines of refiners, each consisting of two No. 3 Hermann Claflin refiners and four No. 5 Shartle Miami jordans, arranged with piping to provide for a two-circuit flow of stock from chests for a primary and secondary refining and a finishing treatment, flowing direct to the paper machine regulating head box. Each of these refiners and jordans is driven by a Westinghouse 350 hp, 400 rpm, synchronous motor.

The control cubicles for these motors and excitor sets are located on a gallery extended from the originally provided gallery at the division wall between machine room and stock preparation room.

An 8- by 12-foot Impo vacuum save-all is located on a platform at the opposite end of the stock preparation room. Underneath this platform are two Trimbey heavy density pump type consistency regulators, controlling the flow of stock from the chests below to the refiners.

Three concrete stock chests, horizontal with mid-feather, equipped with horizontal propeller type agitators, motor driven through gear reducers, furnished by Shartle Brothers, provide for the storage and handling of stock from the refiners to the machine and broke returned from the paper machine.

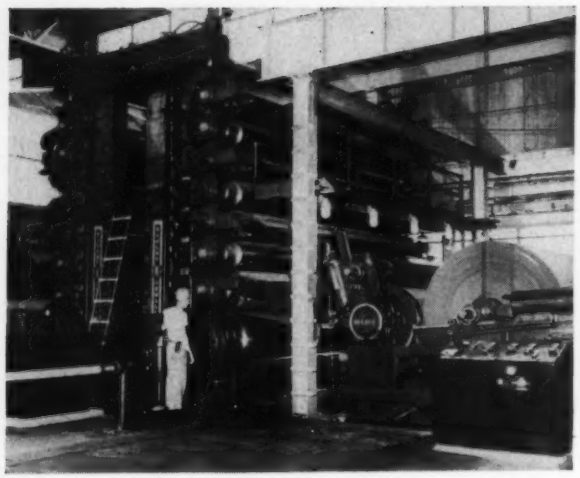
The stock pumps were furnished by Goulds Pumps Inc., and the piping for all stock and white water lines in both the stock preparation and machine rooms is farbricated stainless steel.

All the concrete stock chests throughout the mill extension, and various pits and chests under the paper machine, have been lined with Semplate tile by Stebbins Engineering & Mfg. Co. Semplate tile linings were added also in the concrete stock chests and various pits that were originally built in the mill.

Pulp mill

The digester building extension, 26 feet wide by 150 feet long, houses seven added digesters of 2700 cubic foot capacity, 10-foot 6-inch diameter by 41 feet long, furnished by Chicago Bridge & Iron Co. Each digester is provided with an 8-inch stainless steel Yarnall-Waring seatless blow valve, equipped with a cylinder for hydraulic operation.

An added belt conveyor over the extended chip bins above the digesters and clam shell type of discharge gates at the hoppers of the chip bins for filling



Close-up of calender stacks

Winder and controls; hydraulic table raised

the digesters were supplied by Jeffrey Mfg. Co.

There is still to be added to this part of the mill another blow tank and digester blow heat recovery unit to provide more flexibility in cooking operations and minimize downtime. It is expected that these installations will be completed by the end of this year.

The washer room was extended with a structure 40 feet wide by 98 feet long, in which to install an Impco brown stock washing system, consisting of one line of three 8-foot by 12-foot washers, with repulpers and a vibratory deknotter.

Three 30-foot diameter by 20-foot steel tanks for the storage of the black liquor filtrates from the washers and one 20-foot diameter by 35-foot high steel foam tank, located on the ground in the area adjoining the extended washer room, were furnished and erected by Chicago Bridge & Iron Co.

The washer hood and exhaust system were furnished by J. O. Ross Engineering Corp. and consist principally of a Transite panel type of hood over the washers with an exhaust outlet to two 42-inch axial exhaust fans.

The instrumentation and control for the brown stock washing installation was furnished by Bristol Co.

In the extension of the screen room building, 72 feet wide by 90 feet long, there are installed 16 Impco four-plate bronze vat, flat screens, arranged in eight lines of two screens per line, and two 8-foot diameter by 8-foot wide Impco vacuum deckers with repulpers. The thickened stock delivered from each decker flows to a DeZurik pan type consistency regulating unit on the screen room floor before discharging into the screened stock chest below.

Two concrete stock chests, horizontal with mid-feather tile lined, each equipped with two horizontal propeller type agitators, motor driven through gear reducers, are located on the ground floor, one in the screen room and one in the washer room to provide for the storage and handling of thickened stock from the screens and the stock from the washers.

Wood handling

No extensions or additions were required for the woodroom for the preparation of chips for the increased production capacity afforded by the addition of No. 4 paper machine, but a rearrangement of log conveyors, railroad tracks, and woodyard storage is being effected to provide more complete mechanization of handling pulp wood from cars to storage piles and to conveyors by tractor crane and log grab.

Chemical recovery and liquor making

In the evaporator building, in space 18 feet wide by 80 feet long, adjacent to the set of evaporators originally installed and reserved for an extension, added steel supports were erected and a sextuple effect, vertical type black liquor evaporator, furnished by Swenson Evaporator Co., was installed.

Two Tomlinson black liquor recovery units, with automatic soot blowing equipment, separately fired superheaters, and cyclone evaporators, furnished by Babcock & Wilcox Co., similar in most respects to the recovery unit installation originally installed in the mill except somewhat larger in dimensions and rated capacity, were erected in a building addition 80 feet by 80 feet, built adjacent to the original recovery unit building.

An electrostatic precipitator for dust recovery from the gases of the new recovery units has been furnished and erected by Koppers Co. It is located alongside a similar unit that had been added to the mill since it was originally built, but before the start of the expansion program for No. 6 paper machine. It is expected to materially abate the smoke and alleged pollution of the air by the operation of these precipitators, as well as afford economies in the recovery of chemicals.

In the causticizing and liquor making plant Dorr Co. has supplied causticizing reaction tanks, green liquor and white liquor clarifiers and mud washing and thickening tanks with pumps and auxiliary equipment, duplicating the original unit installation for the mill to provide the needed increased liquor making facilities. A larger size lime slaker replaced the one originally installed, and additional steel tanks were erected for white liquor storage and sludge handling.

A new lime reburning kiln, 8-foot diameter by 140 feet long, similar to the kiln originally installed in the mill, was furnished by Vulcan Iron Works. Provided with a firing hood for either gas or oil firing and fed by dry mud from an Oliver mud filter, 6-foot diameter by 4 feet, the new installation has been located adjacent to the original one.

To recover the dust from the gases from this kiln, as well as from the kiln originally installed, a Rotoclone unit furnished by American Air Filter Co. has been erected at the gas discharge ends of each kiln. It is expected to further improve the alleged pollution of the air and provide smoke abatement by the operation of these Rotoclone units, as well as obtain an increased output of lime from the kilns.

Steam power plant

To provide for the increased demand for steam for the added pulp and papermaking facilities and power required therefor, an added integral furnace boiler, natural gas fired, 140,000 pounds per hour capacity of 400-pound steam, furnished by Babcock & Wilcox, was erected in a building 40 by 60 feet, extended from the original boiler house.

In addition to this available steam

output, it is expected to obtain from each of the boilers of the two recovery units 61,000 pounds per hour of 400-pound waste heat produced steam.

A Babcock & Wilcox Sterling type boiler, 400-pound design, 50,000 pounds steam per hour capacity with double cell dutch oven, was erected to provide for the disposal of the bark and refuse from the wood handling and chipping operations. The bark and refuse is delivered by belt conveyor from the barking drums and other points of origin to a steel bin with screw feeders, built and furnished by Hofft Co., and located over the dutch oven of the boiler. A fly ash and soot collector, designed and furnished by Buell Engineering Co., is installed between the furnace gas outlet and the induced draft fan for precipitation of the dusts and solid particles in the gases, and thus provide further abatement of smoke and improve the alleged pollution of the air.

Electric power plant

A new building, 40 feet by 100 feet, extended out from the original electric power plant, houses the installation of two 5000 kw, 2300 volt, ac 80 per cent P. E. Westinghouse turbine generators and the electric feeder distribution switch gear. Each of these units is designed for operation with steam at the throttle of the turbines at 400 pounds gauge and a total temperature of 600F. One of the units is provided with a 6,000 square-

Hydraulics does the work at Pensacola

The switch was turned on at 10:25 A.M. April 5, and within three-quarters of an hour from the time stock was put on the wire, there was an acceptable sheet on the reel. This is the fastest start-up of any large machine built by B&S.

The erection of the machine was under the supervision of Bagley & Sewall's chief erector, George K. Baxter, and the start-up was thoroughly checked and supervised by Bagley & Sewall's chief engineer, Wesley Corbin.

Bagley & Sewall believes this 226" machine to be the most completely hydraulic controlled machine in the world.

Hydraulics is an ideal means for controlling a pressure nip. Not only does it provide a vibration dampener, but because a liquid is noncompressible, controls are provided which relieve pressure instantaneously if a foreign object gets in the nip. There is no inertia of heavy moving parts, springs or compressible gas to overcome.

As part of the hydraulic control system on this machine, a new type of hydraulic guide was developed and used on the wire, press felts and dryer felts.

As the modern machine has grown in width and speed, it has outgrown the limitations of the standard mechanical guide. The faster and wider the machine, the faster and longer the movement of the guide should be for the same degree of guiding. Physical limitations restrict these characteristics on the mechanical guide. The operator can regulate both the speed and stroke to take care of his machine requirements. Also, the pressure of the paddle signal has been reduced below that of the mechanical guide so the wear on both the edge of the clothing and the paddle itself has been reduced. Because of the tremendous force available in a hydraulic system, this guide has the ability to positively move a heavy piece of equipment, such as a relatively large diameter heavy guide roll which must be used on a wide, high speed machine.

Hydraulic dryer felt stretchers have been incorporated into this machine. This has an advantage in that the actual tension in the felt is accurately recorded and maintained through hydraulic controls. The mechanism is sensitive to tension and moves in either direction. If, for any reason, the length of the dryer felt is shortened, for instance, due to the wrapping of a dryer with paper or wad running around the dryer, the controlled hydraulic pressure on the take-up of the stretch mechanism allows immediate relief, without excess tension in the felt.

This hydraulic system is self-controlled in consoles, one for the wet end and one for the dry end. The panels have all the controls clearly identified. The body of the console contains the motors, pumps, tanks, etc., easily accessible and centrally assembled for ease of maintenance. The system is a dual system with a complete standby pump unit always available in case of possible trouble with the running unit. Through a system of automatic controls, the standby system is automatically brought in if the running unit indicates trouble. Although the system is automatic, there are also physical signals which tell the operators what is happening.

The only parts on the fourdrinier frame that actually move are the breast roll, which swings down, and the inside wire rolls, which swing up hydraulically. Even the suction couch roll is mounted on the fourdrinier framing so there are no removable pieces to handle or connections to break during wire changing. The entire fourdrinier unit, weighing over 250,000 pounds, is permanently cantilevered from the backside so that when the front is opened to receive the wire, the total deflection of the unit across the machine is only a matter of one-sixth of a degree. This insures the accuracy of all settings on the unit from one wire run to the next and prevents damage to the precision equipment, which might occur due to heavy angular movement of the unit or actual physical movement of the unit, as sometimes occurs in standard methods of wire changing.

All equipment mounted on top of the wire, such as deckling device, dandy roll and catwalk, is picked up by permanently located drapes which vertically lift the equipment and suspend it above the top of the fourdrinier during wire changing.

The wire stringing device itself, despite the fact that the fourdrinier is about 60 feet long from the breast roll to the couch roll, has no beams or connectors between the wire stringing pedestals.

Through an unusual method of tightening the wire between these pedestals, it is possible to string the wire at practically wire-running tension. This tight wire can be moved on to the fourdrinier with a definite assurance that the wire will not sag and run into interference when moving across the fourdrinier.

On the hydraulically-controlled calender stack the operator has the ability to control pressure on either end individually, with the pressure recorded on dials. Through the use of the hydraulic system, it is possible to reduce vibration on the stacks to a minimum and relieve pressure nips immediately if a wad or foreign object wedges in the nip. With the open stack, the rolls are removed by unbolting bearing housings and carrying the rolls out of position in machine direction.

Hydraulic rams are provided on the bottom or king rolls which move these rolls out of line to the point where an overhead crane can pick them up.

The winder is the first of the new design Bagley & Sewall large mill type winders. This winder is controlled through a combination of hydraulic and pneumatic means, and no manual effort is required to move any of the rolls or parts on this unit. The main winding drums are individually driven and electronically controlled. Regenerative braking insures proper tension on the sheet throughout the run cycle.

The pressure of the score cutting blades against the platen roll is controlled by pneumatic means on individual knives. The platen roll itself is positively driven through a variable speed drive which will compensate for a change in diameter of this roll as the sleeves are ground.

Pressure of the rider roll on top of the paper can be controlled to a pre-set pattern through the build-up of the roll. The running speed, acceleration, and deceleration of this rider roll is positively controlled through a hydraulic motor drive on each end of the roll.

This paper machine was designed for a production of 400 tons per day at a speed of 2200 feet per minute. It has a 226-inch wire and an overall machine length of better than 400 feet. Although this machine is made up of over 350,000 individual parts which must all fit and coordinate, requiring over 100 freight cars to transport, and is of new design from one end to the other, it took only 45 minutes on the start-up from the time the stock was put on the wire until an acceptable sheet was on the reel.

foot Westinghouse surface condenser, circulating pump, condensate pumps and required auxiliary equipment and arranged for the extraction of 50 pounds gauge steam. The other unit is arranged for the extraction of 150 pounds gauge steam and exhausts at a back pressure of 50 pounds gauge. The arrangement of electric power distribution consists of transmitting the generated power at 2300 volts through feeder cables, direct to the starting controls of all the 2200 volt motors (75 hp and above) and to several 1000 kva air transformer power centers, located in the mill from which the 440 volt distribution feeders are run to the various motor control centers.

Units still in progress

Because of a later start in construction or delay due to obtaining structural steel, strikes at vendors' plants, or other causes, there is in progress construction on several plant extension units not yet completed. Included in these is a building 55 feet by 72 feet for housing two roll grinders, moved from present positions in the mill, and a storage space for various rolls for the paper machines.

A paper roll storage building 120 feet wide clear span by 438 feet long and 48 feet high, with overhead crane runways for two cab-operated hoist and roll grab units on transfer bridges, to provide for storage of paper rolls between the paper supply and the bag plant operations is under construction, with completion scheduled for late this year.

An extension 360 feet wide by 144 feet long to the bag plant has been underway for some time, but progress has been retarded by lack of structural steelwork to permit erection of the building. It would appear from the deliveries of steelwork that are now scheduled that this structure will also be completed and equipped for operation by the last quarter of this year.

Construction

In general, the buildings involved in the plant extensions conform to the construction of the buildings originally provided in the mill, and consist of structural steel framework on concrete foundations, with concrete floors on ground and suspended steel members, corrugated Transite siding on steel girts with steel sash for paper mill and power plant buildings and open canopy construction for the buildings for the pulp mill and power plant. Pre-cast concrete tile slabs, supported on steel purlins, and covered with a build-up roofing form the roofs for paper and pulp mill group of buildings, while corrugated Transite is used for the roofs of the power plant and recovery group of buildings. Steel grating walkways, platforms and stairs are used extensively in the recovery building.

Pensacola equipment and suppliers

Paper Machine	Bagley & Sewall Co.
Nash Vacuum pumps and silencers	Clark & Vicario Co.
Pressure Slice and Inlet	Pusey & Jones Co.
Mixing Pump	Ingersoll-Rand Co.
Condensate Removal system and drying control	Midwest Fulton Machine Co.
Crane Bridge Extension	Manning, Maxwell & Moore
6-Ton Reel Crane	Euclid Crane & Hoist Co.
Hood and Exhaust System, Ross Grewin System, Heating and Ventilating Units, Washer Hood and Exhaust	J. O. Ross Engineering Corp.
Broke Beater, Miami No. 5 Jordans, Propeller Agitators and Drives	Shartle Bros. Machine Co.
Consistency Regulator-Paper Mill	Trimbey Machine Works
Consistency Regulator-Pulp Mill	DeZurik Shower Co.
Freight Elevator	Otis Elevator Co.
Scales	Toledo Scale Co.
Claflin Refiners	The Hermann Mfg. Co.
Digesters	Chicago Bridge and Iron Co.
Blow Valves	Yarnall-Waring Co.
Chip Bin Gates	Jeffrey Mfg. Co.
Brown Stock Washers, Flat Screens, Thickeners, Save-all	Improved Paper Machinery Corp.
Chrome Nickel flat screen plates	Magnus Metal Corp.
Multiple Effect Evaporators	Swenson Evaporator Co.
Steel Storage Tanks, Stacks	Chicago Bridge & Iron Co.
Turpentine Recovery Equipment	Foster-Wheeler Co.
Boilers—gas fired, Boilers—bark fired, Recovery Units	Babcock & Wilcox Co.
Fly Ash Collectors	Buell Engineering Co.
Electrostatic Precipitators	Koppers Co.
Rotoclones	American Air Filter Co.
Lime Kiln	Vulcan Iron Works
Gas Burner for Kiln	Coppus Engineering Co.
Bark Storage Bin and Feeders	Hofft Co.
Causticizing Equipment	Dorr Co.
Liquor pumps and Boiler Feed Pumps	Ingersoll-Rand Co.
Stock and Water Pumps	Goulds Pumps, Inc.
Chip Conveyor Belt	Jeffrey Mfg. Co.
Deaerating Feed Water Heater	Elliott Co.
Turbine Generators, Condenser and Pumps, High Voltage Switch Gear, Low Voltage Control Centers, Indoor Transformer Power Centers, Paper Machine Sectional Drive, Motors	Westinghouse Electric Corp.
Magnetic drive coupling	Electric Machinery Mfg. Co.
Air Compressor	Chicago Pneumatic Co.
Vertical Air Compressor	Gulf Engineering Co.
Air Compressor	Ingersoll-Rand Co.
Boiler Meters, Metering Equipment	Bailey Meter Co.
Pulp Mill Instruments	Foxboro Co.
Washer Instrumentation, Liquid Level Controls	Bristol Co.
Lime Kiln Controls and Instrumentation	Minneapolis Honeywell Co.
Steam Reducing Stations and controls	Mason-Neilan Regulator Co.
Swartmont Desuperheaters	P. H. Nichols Co.
Proportioning pump	Hills-McCanna Co.
Electric Syntron Vibrators	G. E. Stinsman
Structural Steel	Virginia Bridge Co.
Miscellaneous Steel	Mobile Steel Co.
Sprinkler Installation	Moore Pipe and Sprinkler Co.
Tile Linings for Chests and Pits	Stebbins Engineering & Mfg. Co.
Kiln Lining and Refractories	Harbison Walker Refractory Co.
Suspended Arches, Supported Walls for Bark Boiler	LaClede Arch Co.
Refractory Materials	Carter-Beardon Co.
Air Duct Systems	Independent Roofing and Const. Co.
Plug Valves	DeZurik Shower Co.
Fabricated Stainless Steel Pipe, tanks and regulating box	W. L. Rives Co.
Fabricating steam piping	Crane Co.
Paint—materials	Mobile Paint Mfg. Co.
Painting—labor only	J. I. Hass Co. Inc.
Insulation—pipe, Mastic Coating on Tanks and vessels	Shook & Fletcher
Tubings and fittings	J. M. Tull Metal & Supply Co.

Paper and paperboard making—XXII

HARRY WILLIAMSON

Fourdrinier Machine Fundamental Principles

Part 2

Harry Williamson —author of Paper and Paperboard Making

Formation Factors

AS WE KNOW the formation of a sheet of paper is the result of first creating a suspension of fibers in a proportionately large volume of water; delivering the mixed volume onto a traveling wire mesh; and, by draining the surplus water through the wire mesh, the papermaking fibers become interlocked and "nested" with each other on the surface of the wire mesh as a homogeneous entity.

Obviously, the delivery of a continuous supply of large volumes to finally emerge as a UNIFORM solid requires CONTROL. The essential factors of such control are:

(1) The control of the CONSISTENCY of the mixed volume; the even continuity of the proportion of fiber to water in each individual gallon of mixed volume.

(2) Control of the unit application of mechanical and hydraulic means of retarding or accelerating the drainage of water through the wire mesh.

(3) Control of the TOTAL TIME RATE at which water is drained from the forming sheet.

As formation is effected by water drainage, then it is at once obvious that the rate of water drainage governs the TIME RATE OF FORMATION. Therefore, the factual statement may be made that any mechanical devices, or hydraulic flow actions, each controllable in degree of application and specifically designed to either retard or accelerate the flow of water through the wire mesh are, in combined effect, the control of the time rate of formation as far as the paper machine is concerned. (The greatest factor of control of formation by time rate of formation is in the development and preparation of the fibers before they are delivered to the machine room. Subsequent chapters are devoted to stock preparation.)

As far as the mechanical and hydraulic flow action of the paper machine formation area on the forming sheet is concerned, the following factors, in the order named, have most bearing on this most important phase of paper making, THE TIME RATE OF FORMATION:

(1) The slice velocity of the mixed volume as it comes in contact with the traveling wire mesh.

(2) The type or design of weave, or mesh, of the woven wire, e.g., the size and number of openings per square inch of woven surface through which the water can drain.

(3) The tube, or table roll, sections of the formation area which support the traveling wire. These revolving rolls, in direct contact with the wire cloth, exert a capillary attraction on the water draining through the wire mesh. The number of tube rolls used, the diameter and revolutions per minute, the spacing and clearance capacity of the tube rolls each revolution, all may be used in relation to *control* of water drainage and therefore control of time rate of formation.

(4) The shake device, the number and length of strokes per minute applied to the fourdrinier formation area. (Note: the sideways, or shaking, motion applied to the wire while the mixed volume of water and fibers is flowing longitudinally will RETARD the drainage of water through the wire mesh in ratio to the intensity of the shake motion applied.)

(5) The distribution and total amount of vacuum applied to the forming sheets, the points of application, the number of units of application, the individual surface area of each unit of application, the degree and intensity of application of vacuum at each point.

The flexibility and RANGE of degree of control exercised individually and collectively by all the above factors concerned with the drainage of water, and therefore with the TIME RATE of paper formation, have much to do with the quality of the individual sheet and also are deciding factors on the linear foot speed at which a given grade of paper may be formed.

Slice Velocity

The delivery of the mixed volume of water and fiber to the receiving head box of the fourdrinier machine is accomplished by a series of pumping, screening, valved piping controls usually equipped with overflow systems for continuity of supply and regulation of consistency of volume. The volume for immediate use is impounded in the head box by the slice, thus creating a "head" of liquid. The released pressure or velocity of this head is the unit of control to regulate the delivery of the mixed volume to the linear foot speed of the traveling wire mesh. The space of the slice opening to release the mixed volume is the unit of control of volume per minute.

It is therefore apparent that the delivery of the mixed volume from the head box to the traveling wire on which the sheet of paper is to be formed is variable as to:

(a) the head height (pressure) of the mixed volume impounded by the slice;

(b) the height of the slice lip from the surface of the wire which regulates the area of the opening through which the mixed volume flows to the surface of the traveling wire mesh, and

(c) the consistency of the mixed volume; ratio of fiber is to water; the consistency is changed to meet either the requirements of ream weight, machine production speed, and, in some instances of specialty papers, to obtain an accented emphasis of a given specification.

The freeness or slowness of the stock delivered to the head box is largely responsible for the "positioning" or regulation of the slice, and because of this we may further say that a fully experienced machine tender utilizes the control of the slice to produce the desired change in volume, velocity or both required to provide good formation. When the range of slice adjustment fails to accomplish the desired result, the machine speed may be varied up or down to correlate the work of the slice.

During the past 30 years the width and running speed of the fourdrinier paper machine has made rapid strides so that speeds of 1,000 to 1,400 feet per minute with widths in excess of 200 inches trim is now common practice in the manufacture of fine printing papers. When first the 1,000 feet per minute was reached we either made newsprint (the high percentage of groundwood in the furnish made the problem of formation much easier) or kraft bag paper, where an open or wild formation was preferred. With this increase in speed and width the requirements of mixed volume has gone up from hundreds to thousands of gallons per minute, and the problem of delivering this vast volume from the slice to the traveling wire mesh in even continuity of controllable flow has become more difficult.

The ideal delivery which is aimed for in the many designs of head box and slice combination is to deliver the mixed volume to the traveling wire mesh at a speed equal to the running speed of the wire and with the mixed volume distributed EQUALLY over every square inch of the formation area of the wire.

The design of the head box and slice is the problem of the machine builder and the paper mill engineers. The OPERATION of the slice is in the hands of the machine tender, who can adjust any one section or the whole of the slice to suit his operating conditions.

The LIMIT of the machine tender's control is to:

(a) increase the width of the slice opening to allow MORE volume; close the opening a little for LESS volume to flow on the wire, and

(b) raise or lower the impounded head height of the mixed volume BEHIND the slice to change the speed or velocity of the flow FROM the slice TO the wire mesh.

Head height pressure

Theoretically, the velocity (V) or speed in feet per second of a fluid flowing through an orifice is equal to that acquired by a body falling freely in vacuum through a height or depth equal to the head in feet measured vertically from the level surface of the fluid in the vessel to the center of gravity of the orifice, or, in this instance, the slice opening. The mathematical expression is:

V equals $\sqrt{2gh}$ equals $\sqrt{64.4h}$ equals $8.03\sqrt{h}$, (g) being the acceleration of a falling body in vacuum, which is equal to 32.2 feet per second and (h) the height. From this equation the theoretical velocity of a head of mixed volume of 12 inches would be 1 foot x 8.03 x 60 seconds equals 481.80 feet per minute.

From this theoretical figure must be deducted the loss in speed by friction of the stationary slice lip and the delivery board. This figure will change with the consistency of the mixed volume; the more fiber content per gallon the greater the friction loss. The average run of office use papers with their respective ream weights will run about 0.4 to 0.5 per cent consistency, or 200 pounds of mixed volume will be impounded behind the slice to effect the formation of one pound of paper.

Consistency of fiber content

The consistency of the mixed volume is usually in ratio to the ream weight of the paper made and the machine running speed at which the paper is made. There are many ream weights, as there are a great many different types and grades of paper. For purposes of discussion we will use the ream weight of 24 x 36 — 500 sheets, or 3,000 square feet of paper equals one ream.

A comparison of everyday usage paper will visualize to the student what is meant when we say 3,000 square feet of newspaper will weigh 32 pounds, or the same number of square feet of toilet tissue paper will weigh 10 pounds, and one ream of kraft sugar bag paper will weigh either 25 pounds, 30 pounds or 40 pounds, according to the amount of sugar it has to safely carry.

Assuming we were making that same range weight of kraft sugar bag—25 pound, 30 pound, 40 pound ream weight—and we wanted to run the machine at exactly the same speed in feet per minute, which in turn would mean the same pressure head or height of mixed volume impounded behind the slice for delivery to the traveling wire mesh, then with each change in ream weight, say from 25 pounds to 30 pounds, we would have to add MORE fiber to the water, and therefore the CONSISTENCY of the mixed

volume from which the paper is formed would have been raised.

In paper mill operating language this would be quoted as a "higher consistency." The consistency range, with the exception of certain specialties, is within the bracket of 0.07 per cent to 1.0 per cent, with the 10-pound ream weight papers in the lower range; the 25-pound to 40-pound papers in the middle range of 0.4 per cent to 0.6 per cent, and the heavy weight papers of 100-pound to 140-pound ream weights in the upper range of 0.8 per cent to 1.0 per cent.

In the preceding paragraph on head height pressure we mentioned that as the consistency changed the flow friction through the slice opening, and therefore the speed of delivery, would also change; we know we are dealing in changes of 1/10th of 1 per cent and it is hard to visualize a change of fiber content in liquid volume of such small proportions. We must also remember that the even formation of a sheet of paper is dependent on maintaining the INDIVIDUAL FIBERS IN SUSPENSION in the carrying media water until and during the action of interlocking and nesting the fibers into a continuous whole. We CANNOT have BUNDLES of fibers settling as such on the surface of the wire; if we did we would have LUMPY and UNEVEN formation.

A good description of what we mean by "fibers in suspension" in water is that used in the article "Photographic Study of the Motion of Fibers and Water in Flowing Fiber Suspensions." This article, published in Volume 23 Technical Association Papers 1938, was the work of Lamar A. Moss, then associated with Gilbert Paper Co., Menasha, Wis., and Earl O. Bryant of Champagne Paper Co., New York, N.Y.

In order to obtain photographs of the individual fibers in flow action, they worked with a low bracket of fiber consistency, 0.001, 0.005, 0.01, 0.1, 0.25, from 1/1000 of 1 per cent to 1/4 of 1 per cent. From the lowest figure to 0.05 may be described as a very dilute suspension of fiber, rather than using the word "consistency," and, with the possible exception of the lightest of facial tissues, operating consistencies in paper or paperboard making do not get down that low. In this low bracket of dilute suspension the flow speed or SLICE VELOCITY would NOT be affected in even the slightest measureable result by friction in the passage of the mixed volume through the slice opening to the wire mesh.

In the middle ground operating range of 0.4 per cent to 0.7 per cent consistently the theoretical velocity would be reduced approximately 5 per cent.

The most important point to remember is the NECESSITY to keep the fibers in SUSPENSION until actual DISTRIBUTION in the act of FORMATION. The speed of flow delivery is at all times visible, and readily discernible, during the operation of a fourdrinier paper machine. The control of the velocity of the flow speed by adjustment of the slice opening or the regulation of the impounded head by use of the white water valve is simple and easily applied with instantaneous results.

The problem of variation of consistency is not one of change of formation by change of velocity; it is the problem of the INDIVIDUAL ORIENTATION of fibers instead of the aggregation of fibers into bundles, and the maintenance of ream weight within commercial acceptance. Of these two factors, orientation versus aggregation is the more important.

Orientation versus aggregation

In this question of proportion of fiber to water of the total mixed volume impounded by the slice for delivery to the traveling wire mesh the connotation of the words "orientation" and "aggregation" is intended to convey the thought of the difference between the completely free and random orientation of individual fibers, instantly subject to and influenced by the most delicate flow movement, and the collection of individual fibers as aggregate bundles of fibers moving sluggishly in the total liquid mass and NOT readily responsive to application of FLOW GUIDANCE MOVEMENT.

If we could maintain the random orientation of fibers BEHIND the slice without too much turbulence or the entrainment of air, and immediately as the mixed volume is delivered to the traveling wire mesh have a gradual but POSITIVE control of an evenly CRISS-CROSSED orientation of the fibers with each other, then we would have PERFECT formation at will.

In the range of very dilute suspension of fibers, 0.01 per cent to 0.1 per cent fiber content, it is comparatively easy to maintain the desired random orientation and continuous movement of the individual fibers without the creation of aggregate bundles behind the slice. After delivery from the slice to the traveling wire mesh the formation of the fibers from such a dilute suspension is GRADUAL and, while we do not have POSITIVE orientation of the fibers, the fact that the fibers are individual units and not aggregates of units makes them more responsive to any applied aid or control of formation we may be equipped to use.

From 0.1 per cent to 0.5 per cent consistency may be accepted as the most prevalent condition of the papermaking mixed volume delivered from the slices of fourdrinier machines to the wire, or from the vat system of the cylinder board machine to the rotating cylinder mold. We may here note that the average amount of paper formation on a standard cylinder mold is from 0.002 to 0.005 points of thickness. This at 10 pound per point per ream is the equivalent of 20-pound to 50-pound ream weight formation per cylinder mold. Standard typewriter bond and envelope papers, lightweight kraft bag papers, newsprint papers, all made on fourdrinier machines, are also in this same ream weight range. For this reason, "consistency of the mixed volume ready for formation" may be kept with the fibers while in suspension and results, providing the consistency does NOT EXCEED 0.5 per cent.

As the ream weight of the paper and the consistency of the mixed volume is increased it becomes more difficult to keep the individual fibers in random orientation. Small aggregates or bundles of fibers appear in suspension behind the slice as the unit of formation instead of the individual fibers. From 0.6 per cent to 0.8 per cent the smaller of such aggregates will be broken up into individual fibers in suspension

again by the turbulence of the jet-like emission of the mixed volume from the slice opening to the traveling wire mesh.

As the necessity to break up fiber aggregates by slice violence is increased, the re-orientation of the fibers during the act of formation becomes less controllable, and the formation of the sheet of paper shows a CLOUDY rather than a CLEAR look through when examined over the "light box." To offset this cloudy formation it is good operating practice to use a double or secondary slice. By this means a larger total volume may be used, thus dropping the consistency down a little. This in turn would mean a higher head height behind the slice, and the pressure velocity would then be faster than the linear speed of the wire. The excess speed and turbulence from the No. 1 slice opening is brought under control by flow . . . contact with slice No. 2. Between the two slices a separate head or pond is formed, and the fiber aggregates are more nearly broken up into individual fibers in suspension, thus clearing up the formation look through.

In the range of 1.0 per cent consistency the fiber aggregates become so large and numerous in proportion to the fibers remaining individually in suspension that the finished formation is definitely lumpy in look through. This lumpiness or uneven formation may be leveled out by subsequent pressing while the paper is still in a wet state, but the uneven condition of the formation would be evident if either a density or penetration test were to be applied to the sheet.

Until the reader has actual experience in paper mill operations it is extremely difficult to co-relate the consistency of a mixed volume of papermaking fibers and water with such expressions as "flow speed" and "slice velocity." The question naturally arises, "If a consistency of only 1.0 per cent of fiber and 99 per cent water will, in flow, form aggregates of fibers which are detrimental to perfect formation, then at what consistency will a mixture of papermaking fibers and water cease to be in a condition which may still be defined as flow?" The consistency we have been discussing under the heading of "orientation versus aggregation" is that of the mixed volume for the final operation in the actual manufacture of a sheet of paper, namely the FORMATION. From the completion of formation all subsequent operations on the paper machine primarily remove further liquids and then evaporate the still surplus nascent moisture from the paper in the form of steam. The following comments will clarify for the reader the consistency bracket of operation of each major department of a paper mill.

Bleaching: Fiber, 8.0 per cent to 12.0 per cent; NO flow; movement by screw PUSH.

Beating: Fiber, 5.0 per cent to 6.5 per cent; SLIGHT flow; movement by BEATER ROLL.

Jordaning: Fiber, 2.5 per cent to 3.5 per cent; GOOD flow; movement by PUMP.

Riffling: Fiber 0.1 per cent to 0.3 per cent; Very GOOD flow; movement by PUMP.

Screening: Fiber 0.05 per cent to 0.5 per cent; Very GOOD flow; movement by PUMP.

Paper Machine: 0.01 per cent to 1.0 per cent; Very GOOD flow; movement by PUMP.

Pulpwood decay: effect on yield and quality

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This literature review showing the effect of decayed pulpwood on the quality and yields of groundwood, sulphite, and soda pulps was made at the request of the fundamental research committee of the Technical Section, Canadian Pulp & Paper Association. It is part of a more comprehensive review that includes chemical, physical and biological studies of decay, as well as methods of measuring decay.

Groundwood pulp

Kress (5) was one of the earliest workers to make a comprehensive investigation of the problems involved in the utilization of decayed pulpwood. He was able to isolate 70-odd organisms from infected pulps and found that the paper made from decayed groundwood pulp contained shorter fibers, was much darker in color, possessed reduced strength properties and gave a 10 per cent lower yield than that from undecayed groundwood pulp. Also it was found that the use of decayed groundwood caused difficulties in machine operation and increases in foaming, size requirements and dirt content.

These results were confirmed by Bray and Staidl (3) in their investigation of the chemical changes involved during decay of wood and wood pulp and the effect of wood decay on pulp yields and quality. Samples of spruce, balsam, hemlock and aspen wood in various stages of decay were obtained from Canadian

Table I—Yields of Sulphite Pulp from Sound and from Decayed Insect-killed Spruce Wood

Agent of Decay	Specific Gravity		Pulp Yields on wt. basis from		Pulp Yields on vol. basis (gm/100 cc.)		Yield (vol. basis) from Decayed Wood / Yield (vol. basis) from Healthy Wood × 100
	Healthy Wood	Decayed Wood	Healthy Wood	Decayed Wood	Healthy Wood	Decayed Wood	
			%	%	%	%	%
Fomes pinicola	0.386	0.319	49.1	43.0	18.9	13.7	72
Polyporus abietinus	0.335	0.240	53.4	49.6	17.9	11.9	66.5
Blue sap stain*	0.343	0.384	51.3	51.3	17.6	19.7	112(a)
Red sap stain**	0.508	0.464	45.9	47.6	23.3	22.1	95
Brown sap stain***	0.382	0.374	49.7	50.1	19.0	18.75	98
Trametes pini	0.477	0.295	49.2	59.0	23.4	17.4	74

(a) All the sapwood in this specimen was affected by stain. The control specimen had to be cut from the heartwood which was of faster growth and lower density. The higher yield from the decayed section on the volume basis is, therefore, not significant.

*This stain was found to be the first noticeable defect due to death of the tree following bark beetle attack but did not cause the wood to become friable as with brown and white rot decay.

**This stain is said not to be confined to the sapwood but it may continue into the heartwood.

***This stain invaded the entire sapwood causing a brown discoloration and also made the wood slightly more friable.

and American mills and examined microscopically to estimate the amount of mycelium present. Chemical analyses and pulping trials of the samples showed that the groundwood pulp obtained from badly rotted spruce wood contained almost the same amount of cellulose (alpha, beta and gamma) as the pulp from the sound spruce wood, although the yield was lower (78.5 per cent by weight). It was also observed that the pulp was more susceptible to further decay, suffering a considerable decrease in alpha and gamma cellulose and a corresponding increase in beta cellulose. The pulps from all the decayed wood samples were dirty, possessed little strength, required more sizing and foamed excessively. They also presented difficulties in papermaking by sticking to couch and press rolls. The lower yields were not compensated for in the grinding process, since the decayed wood was reported to require the same power consumption in grinding as the sound wood. However, Bates (6) found that infected wood could be ground much more quickly than sound wood.

Sulphite pulp

Rue, Miller and Humphrey (7) investigated pulps obtained from spruce, hemlock and aspen in various stages of decay. It was found that, with the exception of samples of wood decayed by the white rot fungus Trametes pini, the sulphite pulps obtained were not materially weaker nor the yields much lower, but the color was somewhat poorer than that from sound wood samples. The darkening of the pulps was roughly proportional to intensity of the wood discoloration. The wood decayed by the lignin-destroying fungus Trametes pini produced higher pulp yields on the weight basis, although all pulp yields were lower on the volume basis. These results, in general, were confirmed by Schwalbe (8), who, in addition, found that the sulphur dioxide consumptions and bleach requirements were higher for decayed European spruce wood than for sound spruce wood.

In a report by Kress and his co-workers (9) the importance of the decay problem in the pulp industry is discussed. The report also contains a discussion of the chemical properties of sound and decayed woods and their pulps. It is stated that sulphite pulps, unless made from wood badly deteriorated, have characteristics not greatly different from those of pulps produced from sound wood, and the yields, on the weight basis, are not materially lower, although the pulps may be slightly darker and the paper produced from the beaten pulps may be more brittle.

Similar conclusions to these were arrived at by Nikitin and Komarov (10), who found that spruce wood, while infected with certain brown rots, could still be successfully used for sulphite pulp manufacture.

In an investigation of insect-killed and fungal-attacked spruce wood obtained from the Gaspé Peninsula, Riley (11) compared the yields of sulphite pulp produced from the healthy portions of the decayed logs to the yields produced from the partially decayed portions. It may be seen (Table I) that in every instance but the one in which suitable wood for the control test was not available, the yields, on the volume basis, are lower for the pulps from decayed wood sections than those from healthy wood sections. However, it is pointed out that since in most cases only a fraction of the wood in a given log was infected, actual yields of pulp in practice would be considerably higher than the table values indicate. The definite increase in yield, on the weight basis, of the wood infected with the white rot Trametes pini is in agreement with the findings of Rue, Miller and Humphrey (7). Somewhat darker pulps were obtained from the wood infected with Fomes pinicola and blue sap stain.

An extensive study of decayed wood for use in the sulphite manufacturing process has been made by Wegelius (12). His results seem to be in agreement with earlier work. He found that the resistance of the sulphite pulp to water, acids and bases decreased with increased decay of the wood chips. Although the cellulose, lignin, pentosan, resin and fat content of the pulps remained relatively constant, the ash content was found to increase with decay.

Martynov (13), in studies on sulphite pulping of fir wood decayed by the white rot Polystictus abietinus, used a mixture consisting of 85 per cent sound and 15 per cent decayed wood (so-called first degree decay in which a change in color was apparent), and found that the digestion time was speeded up while the yield was reduced by only 1.5 per cent. As the degree of infection of the decayed portion of the mixture increased, it was found that the pulping time was decreased and yields were slightly lower. Fir wood infected with the brown rot Fomes pinicola was stated to be of less pulping value than the white-rotted wood.

Holzer (2) studied the effects of decay in western hemlock heartwood. Although the agents of decay were not identified, his results confirmed those of earlier investigators in that the sulphite pulp yields were found to be almost constant, on the weight basis, while the pulp color became darker and the strength diminished slightly with decay. From the fact that the consumption of calcium base liquor during the cooking was uniform for all samples, Holzer concluded that the sulphonation of lignin proceeded at the usual rate in the decayed wood, but the solubilization of lignin must have been appreciably slower as shown by higher bleachabilities and higher residual lignin contents. Some of Holzer's data appear in Table II.

A considerable degradation of pulp cellulose occurred as is indicated by the drop in viscosity and increase in copper

Table II—Tests by Holzer (2) of Pulp from Western Hemlock Containing Heartwood Decay

Test	Pulp from Sound Wood	Pulp from Medium Decayed Wood	Pulp from Advanced Decayed Wood
Maximum bursting strength (%)	167	150	149
Tearing resistance at maximum burst (%)	0.96	1.06	0.86
Brightness*	56.8	34.1	30.4
Lignin Content (%)	2.71	4.74	5.68
Viscosity (centipoises)	109	67	58
Copper number	2.68	3.64	3.82

*Brightness values taken on No. 1 filter, Gen. Electric reflection meter.

number. As a measure of the change in pulp quality with decay, brightness was found to be the best criterion since this was the property first noticeably affected.

Although decayed wood may give lower yields of sulphite pulp than sound wood, in general it can be said that this pulp suffers only slight loss in quality when the decay is not far advanced. Actually it is not possible, with the data available, to draw specific conclusions. Very often no indication is available of the state of decay of the wood used, nor the organism causing the infection.

Soda and sulphate pulps

In addition to the study of the effects of decay on ground wood and sulphite pulps, Bray and Staidl (3) studied the pulping characteristics of decayed wood by the soda process. It was found that the pulp made from badly rotted spruce wood was very raw, and the authors attribute the rawness to the incompleteness of the cook resulting from neutralization of the alkali. The pulps were found to be high in lignin content and gave high alkali solubility values. The degradation of wood constituents into simpler compounds and the increase in acidity with decay is said to explain the consumption of alkali cooking liquor during early stages of the cook.

Using decayed poplar and white birch samples, Sutermeister (14) found the yields of soda pulp to be much lower than the yields from sound wood samples. In addition, he found that the use of decayed wood in pulping caused difficulties in bleaching operations and that extensive fiber disintegration occurred during beating operations. Even through the use of mixtures of sound and decayed wood it was found that the cost per ton of pulp was considerably increased. Since the fungi responsible for decay were not always identified, and the state of decay was not well described, Sutermeister's results are difficult to compare with those of other workers.

In his thorough study of the effects of the brown rot fungus Polyporus annosus on spruce wood, Storch (4) confirmed earlier work dealing with the effect of decay on the soda process (3, 9), finding that the pulp yields and alpha cellulose contents were decidedly low.

Since the sulphate cook is somewhat similar to the soda cook, the effects of decay on this process are expected to be similar. However, Zherebov and Komarovskii (15) in their experimental sulphate cooks on larch damaged by both white and brown rots found that the yields of unbleached pulp were little affected, though they reported that the quality was poorer and bleaching was more difficult. On the other hand, Martin (19) reported that it would appear to be easier to bleach sulphate pulp obtained from Douglas fir wood decayed by white pocket rot (Fomes pini) than pulp from sound wood. Results reported in this field are apparently contradictory.

Effects of sap-staining fungi on pulp yields and quality

According to Kress and co-workers (9), the active wood-destroying organisms are for the most part Hymenomycetes, or fungi comparatively high on the scale of development. In the case of molds, or sap-staining fungi, the mycelium enters chiefly the ducts or medullary rays of the wood where it feeds on the starches, sugars and other easily digested organic compounds, sometimes passing through the pits but seldom boring through the solid wood substances. For this reason, and also because these fungi usually confine themselves to the sapwood, such infected wood does not suffer a very great loss in strength, the toughness apparently being affected first (1, 16). Sap-staining fungi, or molds, usually do not cause noticeable changes in the physical structure of infected wood, although discoloration occurs. The discoloration is caused either by the actual color of the hyphae or spores of the fungus or by the color of pigments secreted by the fungus. A discussion of the more important molds which attack wood and the types of wood prone to such attack is given by Cartwright and Findlay (16).

Chidester (17) conducted sulphite and sulphate pulping experiments to investigate the effect of blue stain produced in loblolly and shortleaf pines by inoculation of stored chips or by natural development in pulp logs under ordinary millyard storage conditions. It was found that the blue-stained wood yielded unbleached sulphite pulps that were darker in color, had a higher dirt content, and required more bleach than the pulps from the unstained wood. Neither the strength nor yield of the pulps from blue-stained wood was appreciably lower nor were any appreciable differences noticed between results of inoculated and naturally infected wood. From the limited analytical data given it is not always possible to learn what changes have taken place in the amounts of the various components present in the pulps. In the case of sulphite pulp from blue-stained loblolly pine, there was a slight drop in alpha cellulose and a rise in lignin content with discoloration, other properties reported showing no significant changes. No trends could be found in the analytical data for the shortleaf pine sulphite pulps from sound and blue-stained wood. The unbleached sulphate pulps from the blue-stained wood were also darker in color, contained more specks, and required more bleach than pulps from unstained wood. The fact that the hyphae of the blue-staining fungus are concentrated to a greater extent in the ray cells than in the tracheids led Chidester to believe that the color could be improved to some extent by screening out the fine fiber fraction.

A study of the decay and staining of Southern pine pulpwood was made by Hepting (18). He reported that the blue-stained pulpwood may be employed satisfactorily in the production of kraft paper, board, and sometimes high grade white paper. In the pulp used for the production of high grade white paper, more bleach was required to obtain the same color as with pulp from unstained wood.

References

(1) Findlay, W. P. K., Endeavour 8: No. 31. 1949.

(2) Holzer, W. F., Paper Trade J. 112: No. 19; 38.1940; Tech. Assoc. Papers 24: 429. 1941.

(3) Bray, M. W. and J. A. Staidl, Ind. & Eng. Chem. 14: 35. 1922.

(4) Storch, K., Papier Fabr. 35 (Techn. Teil): 485. 1937.

(5) Kress, O., Pulp & Paper Mag. Can. 18: 1225. 1920.

(6) Bates, J. S., Pulp & Paper Mag. Can. 19: 687. 1921.

(7) Rue, J. D., R. N. Miller and C. J. Humphrey, Pulp & Paper Mag. Can. 22: 93. 1924.

(8) Schwalbe, C. G. Papierfabr. (Tech. Teil) 23: 429. 1925.

(9) Kress, O., C. A. Richards, M. W. Bray and J. A. Staidl, U.S. Dept. Agr. Bull. 1298. 1926.

(10) Nikitin, N. I. and F. P. Komarov, Nature and Economy Exptl. Forest Ind. Sta. Forest. Tech. Acad. 3:5. 1931.

(11) Riley, C. G., Pulp & Paper Mag. Can. 36: No. 3; 130. 1935.

(12) Wegelius, Th., Finnish Paper Timber J. No. 15; 594; No. 15a; 125. 1938.

(13) Martynov, M. F., Tsentral. Nanch.-Issledovatel. Inst. Bumazhnoi Prom. Materialy No. 31; 180. 1940.

(14) Sutermeister, E., Pulp & Paper Mag. Can. 19: 733. 1921.

(15) Zherebov, L. P. and V. M. Komarovskii, Trans. Central Inst. Sci. Res. Forest Chem. U.S.S.R. 2: 39. 1933.

(16) Cartwright, K., and W. P. K. Findlay, Decay of Timber and Its Prevention, Chapter IV. Forest Products Research Laboratory. His Majesty's Stationery Office, London, 1946.

(17) Chidester, G. H., M. W. Bray and C. E. Curran, Paper Trade J. April 7, 1938.

(18) Hepting, G. H., Paper Ind. and Paper World. 27: 379. 1945.

(19) Martin, J. S., Tappi 32: No. 12; 534. 1949.

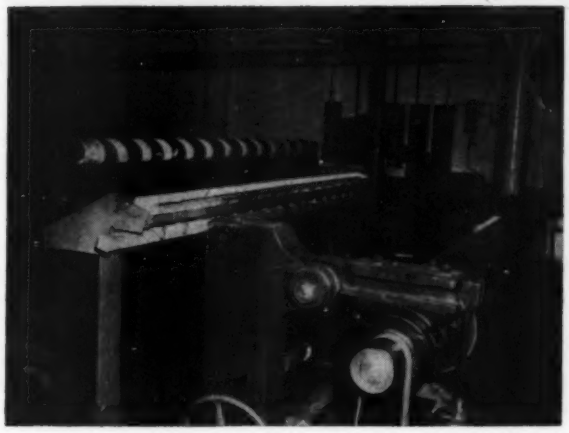

Fig. 1—Line of gas infra-red radiant heaters on a paper machine

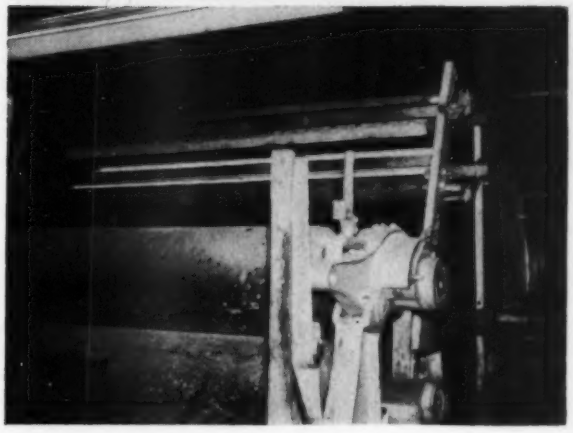

Fig. 2—Double line of gas radiant heaters; such units heat both sides of the paper

Increased paper production and better quality through infra-red heating

A discussion of some of the applications of infra-red, or radiant, heating. Although it is not difficult to make successful applications in a great many situations, a certain specialized knowledge is essential to secure the desired results.

FRANCIS A. WESTBROOK

UNTIL RECENT YEARS the art of papermaking has been handed down through the generations, with quality control a matter of individual craftsmanship. Today, however, paper is being used in so many new and different ways that progressive manufacturers have a real task in keeping abreast of the possibilities. Consequently, research and development absorb a much larger share of their thinking, and out of this has come, among other things, the use of radiant, or infra-red, heating.

In the matter of drying the technique is based on long years of experience with steam as the prime heating means. It is generally plentiful around a paper mill, especially when it is a by-product of the manufacture of electrical power; and usually in the evaporation of large quantities of water steam costs less as a source of heat. Nevertheless, research has shown that there are three places in a mill where radiant heat can be applied efficiently.

Drying

One place is at the beginning of the drying operation, or wet end of the paper machine, where the moisture content is heavy. Here it is practical to drive in heat at high temperature, not for immediate evaporation but to raise the temperature of the material to a point where actual drying by conventional means can be accomplished in much less time and space.

Paper machine

The second place is at the end of the paper machine, where it is desirable to standardize the moisture content with exact uniformity. At this point radiant heat can be used with good results because experience has shown that it is difficult to remove the last 7 per cent of moisture content, and that if it is removed it restores itself quickly but not uniformly. Furthermore, excessive drying takes something out of the paper that does not come back with returned moisture.

For certain special purposes it is desirable to drive out this moisture in order to replace it with some of the new synthetics. However, it is usually not desirable to drive out this moisture but rather to maintain it uniformly throughout the sheet and roll, or throughout the pile if the paper is sheeted. This is absolutely essential if the paper is to be printed. It can be most readily accomplished by a proper application of radiant heat because it makes possible a delicate surface treatment which insures accuracy.

Finishing

The third use of radiant heat is for the finishing of paper with special surfaces or impregnations. If this consists of the application of any of the new

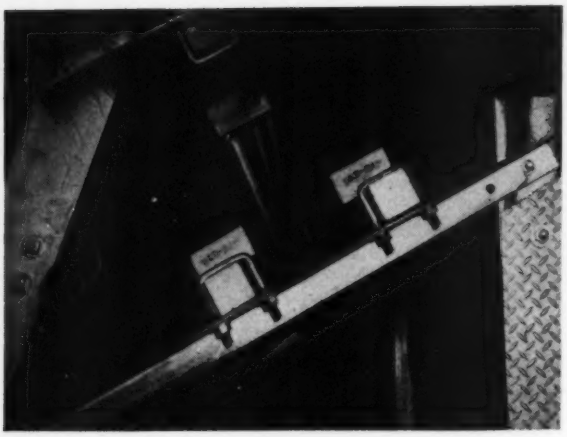

Fig. 3—Heavy papers are dried on this arrangement of several lines of radiant heaters

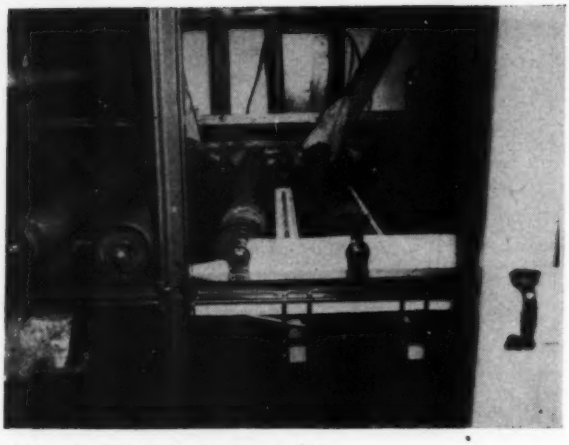

Fig. 4—Gas radiant heaters mounted on a paper machine between rolls

synthetics, it is especially important to give careful consideration to the advantages of this kind of heating. This is because the temperatures at which the synthetic products react are often different from established procedures for evaporating water.

This third type of application of radiant heat is also tied in with the fact that it is practical and simple for reducing moisture to the desired content of 7 per cent, although it is difficult to get it below 5 per cent by this means. Consequently, heating by radiation, or infra-red, is ideal for the final control of the moisture content of the paper within close limits.

How this works out in actual practice becomes plain when it is considered that two things have to be dealt with. In the first place, there is the 7 per cent moisture content which must not be disturbed. In the second place, the solvent in the coating must be evaporated. The latter will take place at 180F., and of course water evaporates at 212F. This leaves a leeway of 32 degrees in which to dry the coating but not the paper. The heat exposure is often only a fraction of a second, and with radiant heating temperatures as high as 2400 degrees, and where 1200 degrees of surface temperature are common, it is possible to heat the coatings the necessary moderate amount in that split second. This can be done with the required precision to make it practicable to produce paper with the uniform moisture content so insistently demanded by printers today.

Fuel selection

For general drying purposes steam, oil, gas or electricity must obviously be selected on a cost basis. If by-product steam is available in sufficient quantity it will doubtless be the most economical. If the mill is located in a region where natural gas, for example, is readily available it may well be the thing to use; the same is true where oil is cheap, and where there is a surplus of electrical power. But for the control of the final moisture content electrical radiant heat is worth consideration.

In the field of papermaking the open glow type of radiant heater is practically always used. With these a refractory is heated to incandescence either by means of an electrical coil or a gas burner. Here again the choice of which to use is largely a matter of economics, but other consideration do enter in. There is no hard and fast rule. In some localities gas is less expensive than electricity and in others the reverse is true. For delicate balances between the evaporation points of water and synthetic coatings or impregnations, or close precision in holding accurate final moisture content, electrical heaters reach incandescence extremely quickly, and automatic controls are relatively easy and inexpensive to apply with safety. Gas radiant heaters also have a wide application and give successful service in many cases.

In connection with radiant heating it should be clearly borne in mind that it acts entirely differently from conduction heating. In a convection heating oven, for instance, the air is first heated and then transfers its heat to whatever is in the oven. The same is true when a stream of hot air is blown against something to be heated or dried. In the steam-heated driers and press rolls of a paper machine the steam first heats the rolls and is then transferred to the web of wet paper in contact with them. A certain amount of time is required for this transfer, and the temperature which can be used without burning or scorching the paper is limited.

With infra-red, or radiant, heating the rise of temperature of the object to be heated is determined by its ability to absorb the infra-red radiation. As air is very poor in this respect there is only little heating of the intervening space. But the wet paper absorbs the radiation much more readily, so that the heating action is very fast, partly because heat is absorbed throughout the body of the material, and not just on one surface, as when it is heated on a roll. As the surface temperature of the incandescent element can be very high, easily from 1200 to 2400F., flash heating becomes possible, as mentioned in connection with the drying of coatings and impregnations.

Applications

With this general background of infra-red heating in mind, it is well to consider a few modern practices which are highly successful.

Fig. 1 shows a line of gas infra-red units on a paper machine, and Fig. 2 shows a double line of units between which the paper passes so as to be heated on both sides simultaneously when heavy papers are to be dried. Fig. 3 shows another arrangement of several lines of radiant heaters for drying heavy papers. These three applications show the versatility of this method of heating to meet varying conditons, both as to the amount of water to be evaporated and the type of machines to which the heaters are to be attached. Electrical radiant heaters can be installed in much the same way.

The use of radiant heaters on paper machines has greatly increased their output, which is usually limited by their drying capacity. Drying capacity can of course be increased by adding more steam-heated driers, provided there is room for them. However, this is likely to be an expensive proposition at best, and if it is desired to increase production it is usually far preferable to install radiant heaters on the existing equipment. This is done by placing the heaters ahead of the first drier or right at it, or both. Gas burners are frequently used in this way at the wet end of the paper

machine; and where radiant heat is installed at the finished end to insure a proper minimum moisture content of 7 per cent as previously mentioned, the electrical type of radiant heater is more generally used.

When manufacturing coated paper, except for certain kinds of clay coating, the fast drying possible with radiant heat has been conspicuously successful and vastly superior to blowing warm air against the material. The point is that drying must take place immediately after application of the coating to prevent it from sticking to the rolls. This can be accomplished by placing radiant heaters between the coating point and the first roll, and if they are properly installed there are plenty of instances on record where the speed of the machine has been almost tripled. Furthermore, the quality of the product is more uniform and generally improved.

Controls

Adequate automatic controls are of course important. While the paper is moving at the right speed the high heat given off by the infra-red units is taken up by the evaporation of the moisture. If the machine stops or slows down materially, a centrifugal governor will shut off the supply of gas or open the circuit of electrical units. Photo-electric switches are also provided to accomplish the same purposes if the web of paper breaks. When the machine stops, the heaters, both gas and electric, can be automatically turned so that the residual heat of the incandescent refractory surfaces will not scorch or set fire to the paper.

Where gas fired units are used, air and gas pressure switches are used to shut off both gas and air if the mixture of the two is not right, and flame rod combustion safeguards are installed to shut down the burners if they are not operating properly. Other controls are also practicable where needed to insure safety.

Automatic controls for electrical units can be provided which switch on additional units as the speed of the paper web traveling through the machine increases and shut off the current entirely if the web travels below a predetermined speed or stops. Electric units are also available for adjustments to accommodate various web widths.

In the drying operations it is obvious that the radiant heat is applied to surfaces neither side of which are in contact with anything, so that evaporation into the surrounding atmosphere may take place freely. When heat is applied by a cylinder with which the paper is in contact, it has to penetrate through to the outer surface to evaporate the moisture which delays drying and also incurs the risk of overheating the material in contact with the cylinder.

Either gas or electric radiant heaters may be placed vertically or horizontally facing upward or downward. Gas units can be used with natural, manufactured or heavy bottled gas, such as propane. When propane gas is used it is imperative to prevent accumulations of unburned gas in pits, etc., which should usually be provided with exhaust fans to help in purging such areas.

When radiant heating units are installed as additional equiment on existing machines, care should be taken to locate them so that the heat will not damage rubber rolls. They should also be placed so as to leave adequate headroom in passageways where workers go back and forth. The heaters should also be so located that they will not make it difficult to thread paper through the drier rolls.

Legal riddles: questions and answers

During the summer of this year the writer traveled several states and had the opportunity of talking personally with many officials and employes of paper mills. In the course of these conversations a number of these men asked legal questions which are answered in this article. These answers will be verified by leading higher court decisions that can be used advantageously by readers and their lawyers to win unavoidable law suits. Hence, readers should file away this article for future reference.

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Attorney at Law

CONSIDERABLE DISCUSSION has arisen from time to time over the legal question: "If a buyer of paper fails to promptly complain to the seller that the latter breached the contract, can the seller sue and recover full payment from the purchaser?"

According to a late higher court decision, the answer is yes.

For example, in Scarry v. Paper Products Co., 224 Pac. (2d) 940, the testimony showed facts as follows: A buyer in Denver, Colo., signed a written order with Paper Products for "1 only carload Fillina Toilet Tissue (650 cases) $9.90 per case." In the space provided on the order blank following the printed statement "Requested Delivery Date," the word "Rush" was typed by the salesman. This order was signed by the buyer on April 10. The bill of lading showed shipment of the carload of paper on April 29. The shipment did not arrive in Denver until May 20. The buyer accepted delivery of the paper but was dissatisfied with it, claiming that the quality was not as promised by the seller's salesman. Also, the buyer testified that the seller's salesman had promised "immediate" delivery, but that the paper was not delivered until six weeks after the order was signed.

Since the testimony showed that the buyer kept the paper 90 days without making a complaint to the seller, the higher court held that the buyer must keep and pay for the paper. The court said:

"Defendant (buyer) had the burden of proof of establishing the fact that notice of the broken promise or breach

of warranty was given to plaintiff (seller) within a reasonable time after it knew, or should have known, that the performance of plaintiff was objectionable."

New trust indenture not taxable

A great deal of discussion has arisen in the past over the legal question: When is a trust indenture non-taxable, as a mortgage substitute?

In Defiance Paper Co. v. Rollin Brown, 60 N.E. (2d) 840, it was disclosed that Defiance executed a trust indenture to a bank and mortgaged real estate and personal property to secure payment of its bonds issued in the amount of $500,000. The trust indenture was properly and legally recorded and tax paid to the state.

Later there was unpaid and outstanding $238,800 on the bonds when these bonds were called in and new bonds issued to the holders. A new trust indenture was executed by the paper company to a bank, as trustee, to secure payment of the new bond issue of $238,000, and certain additional personal property was pledged.

The new indenture was recorded, but the paper company refused to pay the tax on the indenture on the grounds that the new indenture was an additional mortgage and therefore exempt from the tax.

Although the Tax Commission held that the new indenture was taxable, the higher court reversed the decision and held that the indenture is non-taxable.

Helper is trespasser

According to a late higher court decision, a person employed by a truck driver is a trespasser, unless the testimony shows that the employer of the truck driver had given the driver authority to hire an assistant.

For example, in Jaeger v. Sidewater Paper Co., 77 Atl. (2d) 434, it was shown that the driver of a truck owned by Sidewater was loading bales of paper. A boy assisted the driver in loading the paper on the truck. The boy then asked the driver for a ride to his home and was told to climb on the truck. When they reached the intersection the driver stopped the truck, and the boy began to alight. However, before he had gotten off the truck, it started with a jerking motion and he, losing his hold, fell under the truck and was seriously injured. He sued Sidewater for heavy damages.

In holding the boy not entitled to a recovery, the higher court said:

"Plaintiff (Jaeger) does not allege that defendant's truck driver had express authority to invite plaintiff to ride on the truck. Nor can it be said that the evidence would support a finding that the driver had implied authority to employ the boy as an assistant. He (Jaeger) therefore, was only a trespasser as to defendant (Sidewater Paper Company), who then would be liable to him only if plaintiff could show some wanton act or wilful misconduct on the part of the driver while managing the truck."

Can't sign valid release

A reader asked: "Instead of going through complicated legal procedure awarding injured employes compensation through the State Workmen's Compensation Law, can our company compromise with injured employes, pay them amounts of money satisfactory to them and then have them sign contracts releasing our company from further liability?"

According to a late higher court decision, the answer is no. Also, unless an employe thoroughly understands the exact meaning of a release, the court will cancel it.

For illustration, in Rickle v. Wyoming Valley Paper Mills, 38 Atl. (2d) 78, the testimony showed facts as follows: An employe in a paper mill sustained a serious injury. The employe signed two contracts in which he released the company from further payments and liabilities for the injury. For the first the company paid the employe the sum of $100.28 plus a doctor's bill of $90.00. This contract was made on the assumption that the employe soon would fully recover from his injury. However, three months later the employe had to submit to an operation and soon afterward he signed another release and was paid $300.28.

Later the employe filed suit and asked the court to cancel both contracts and releases because he did not realize what he was signing. The testimony showed that the employe's injury had become more serious than expected when the releases were signed. The higher court cancelled the releases, and said:

"A written contract cannot be set aside merely because one of the parties to it put an erroneous construction on the words in which it was expressed, but this principle does not apply to a case where a mistake by one of the parties as to the meaning of the words used has been induced, however innocently, by the other party."

Other higher courts have held that under no circumstances may an employer and employe make a valid contract compromising the amount payable to the employe for an injury, unless the industrial commissioner approves the contract.

Can safeguard health

An official of a paper mill asked this question: "Can a city force our corporation to pay property assessments for a new sewage and water system? Our real property will not be especially benefited, but the value of our real property within the corporate limits exceeds the value of other real property in the city."

According to a late higher court decision, the answer is yes.

For illustration, in Fort Howard Paper Co. v. Town of Ashwaubenon, 26 N.W. (2d) 661, a paper company contested the validity of a usual state law which authorizes municipalities to create sanitary improvements. The city officials assessed real property in the city, including a large tract of land owned by Fort Howard. This company filed suit to prevent the board or officials from collecting assessments on its property to supply money needed for the improvement. The higher court refused to hold in favor of the paper company, saying:

"It is difficult to see how benefit to property due to the organization of a sanitary sewage district to promote the public health and welfare can be apportioned other than on the basis of area or linear foot extent of the property. It is manifest from the proceedings in this case that the property of the plaintiff (Fort Howard Paper Company) will be benefited because the lands are within the watershed and may be served by the proposed improvement."

Hence, according to this leading case, if municipal officials have authority to organize, construct and maintain a sewage or water system, the court will not interfere, although a large corporation not especially benefited will bear a large portion of the expense.

No invention

An executive of a paper mill asked these questions: "Can an inventor always obtain a valid patent on a new invention? How new must the invention be so that a valid patent may be obtained?"

The answer is: An inventor can obtain a patent on an invention that is new and useful, providing inventive ability was needed to make the invention, and not mere mechanical skill capable of being used by any ordinary mechanic.

A recent higher court explained that it is true that inventors may obtain patents on "new and useful" inventions. However, a "patentable" invention must disclose sufficient newness to justify the court to decide that the inventor used more than mere mechanical skill to perfect the invention. Otherwise, the invention is not patentable.

For example, see Kaliska v. Coe, 147 Fed. (2d) 577, where it was shown that an inventor filed an application for a patent on a paper container attractively colored and designed "to induce an ambitious housewife to buy and carry away six bottles at a time." Economical paper

strips at the ends of the package kept the bottles from falling out. An advantage is that the device may be folded flat and easily packed for shipping. The higher court refused to grant a patent to the inventor, saying:

"The idea is as old as a shawl-strap or a valise. If patents were granted on package designs of such a low standard of invention it would tend to tie up retail distribution in an endless network of restrictions."

Of course, a valid patent may be obtained on a new "combination" even though all its elements are old. However, this is true only where the new device produces a "new and useful result" and also where "inventive genius" was necessary to combine the old elements into the new device.

For example, in In re Stover, 146 Fed. (2d) 299, an inventor filed an application for a patent on a paper milk carton having figures thereon. The purpose of the figures was a guide so that a given quantity of milk may be measured by following the figures. Also, another feature of the invention was vents to allow air to escape from the carton when it was being filled with milk.

The higher court refused to hold that this invention is patentable and said:

"A change only in form, proportions, or degree, which merely results in the substitution of equivalents doing the same thing by substantially the same means with better results, is not such 'invention' as will sustain a patent over the prior art."

New patent law

Recently a reader wrote in part as follows: "Can a member of the military service obtain a valid patent without payment of any fees to the government? Can the inventor collect royalties from the government which manufactures or uses his invention? Can the inventor sue and collect royalties from a paper manufacturing company which manufactures goods for the government?

Law of royalties

Section 45 of the U.S. Statutes provides as follows: "The Commissioner of Patents is authorized to grant any officer, enlisted man, or employe of the Government a patent for any invention without the payment of any fee when the head of a department certifies that such invention is liable to be used in the public interest. Of course, the inventor must agree that the invention may be manufactured and used by the Government without the payment of any royalty."

According to a late higher court decision, this law eliminates any possibility of a manufacturer of paper paying any royalties to a patentee who took advantage of this Statute.

For example, in Belanger v. Alton Box Board Co., 180 Fed. (2d) 87, testimony showed facts as follows: An inventor named Belanger obtained a patent on certain paper products while in the United States Army. He took advantage of this law and paid no fee to the United States Government and included in his application for a patent the paragraph: "The invention herein described may be manufactured and used by or for the government for governmental purposes without payment to me of any royalty thereon."

Later Belanger became employed at a salary of $5,000 annually with Alton Box Board, which later made a contract with the government and sold it many of Belanger's patented inventions.

Belanger sued Alton Box Board for royalties. Belanger argued that he was entitled to receive payment of royalties because he invented and patented the invention before he took employment with Alton and also had not agreed to allow the company to make and sell his invention without payment of royalties.

In view of the fact that Belanger had agreed to permit the government to manufacture and use his invention without payment of royalties, the higher court held Alton not liable and said:

"All the foregoing facts and circumstances would seem to make indisputable on this record, that the defendant (Alton Box Board Co.) never promised to pay plaintiff (Belanger) any royalty or commission on such devices which they manufactured and sold to or for the Government in furtherance of the war effort."

This court also explained that although the evidence showed that Belanger had perfected the invention before taking employment with Alton, yet as Belanger had granted to the government a license to make, use and dispose of the subject matter of the invention without payment of royalties, this fact established that Alton was not obligated to pay Belanger any royalty or commission on such devices sold to the government.

Superintendent cannot bind employer

A reader asked this question: "Can an employe, such as a superintendent of a paper mill, obligate his employer on contracts or agreements made with employes?"

According to a late higher court decision, the answer is no. This is so because the courts consistently hold that employers are not responsible for contracts made by ordinary employes, as foremen and superintendents.

For example, in West Virginia Pulp & Paper Co. v. Morton, 45 Atl. (2d) 725, an employe of West Virginia was seriously injured by inhalation of chlorine gas. Although a state law provides that if an employe fails to file a claim for compensation under the State Workmen's Compensation Law within one year he cannot recover compensation, the employe did not file his claim until the year had elapsed.

In subsequent litigation the employe proved that the company's superintendent had promised him that if and when he was unable to work, he would be allowed compensation by the company.

In holding the employe not entitled to compensation, the higher court said:

"If we recognize that the superintendent had the authority to make the promise that appellee (employe) testified he did make to him, then corporation would be at the hazard of everything that an unauthorized agent did in compensation cases."

Not a perpetuity

An official of a paper corporation asked this question: "Is a contract valid under which the owner of common stock in a paper corporation promises that he will sell his stock to a named person, if he sells the stock within 50 years. I have a similar contract with my son, and I have heard that all contracts of this kind are void because they are in the form of a perpetuity."

According to a late higher court decision, such a contract is valid and enforceable.

For illustration, in Everett Bank v. Pacific Waxed Paper Co., 157 Pac. (2d) 707, it was shown that the owner of stock in a paper corporation made an agreement with one White whereby he promised that if at any time during the next 25 years he desired to sell his stock in the paper corporation, he would give White the first opportunity to purchase it at such price and upon such terms and conditions as may be decided upon.

In subsequent litigation, White argued that this agreement is void because it violated the rule against "perpetuities." However, the higher court refused to agree with this contention, saying:

"The rule against perpetuities . . . applies only to the vesting of future estates and does not apply to vested estates. The option agreement did not create a future estate or interest to become vested at some future time."

The higher courts hold that the "rule against perpetuities" prohibits creation of future interests or estates in real property which may not become "vested" within a life of the person now living. This general and universal law was adopted after an experience many years ago whereby a man left $1,000 to remain on interest for 1000 years. The total amount capable of being accumulated over this period is more than practical and not beneficial to the general public. Therefore, the courts decided to invalidate wills, contracts and other instruments under the term "perpetuity."

THE CARTRIDGES USED BY COLT in his early revolvers were covered with paper, saturated with nitrate of potassium.

IN EFFORTS TO EXPAND their papermaking industry, the Chinese are now using chihchi tsao. It is claimed that paper made from this wild grass, which grows along the Yellow River, has greater folding strength than American bank note paper.

A SPECIAL LIGHT-WEIGHT PAPER was used in the late 12th Century for writing letters transmitted by carrier pigeon between Cairo and Baghdad—some 800 miles apart . . .

ODDITIES

THE PAPERMAKERS of OLD used cast-off animal hide parings bought from the parchment makers to make their sizing..

PERKINS
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Perkins Calender Rolls—the natural result of the longest and broadest experience in the industry—give quality that is definitely reflected in your product. Perkins service includes refills of any make of calender rolls.
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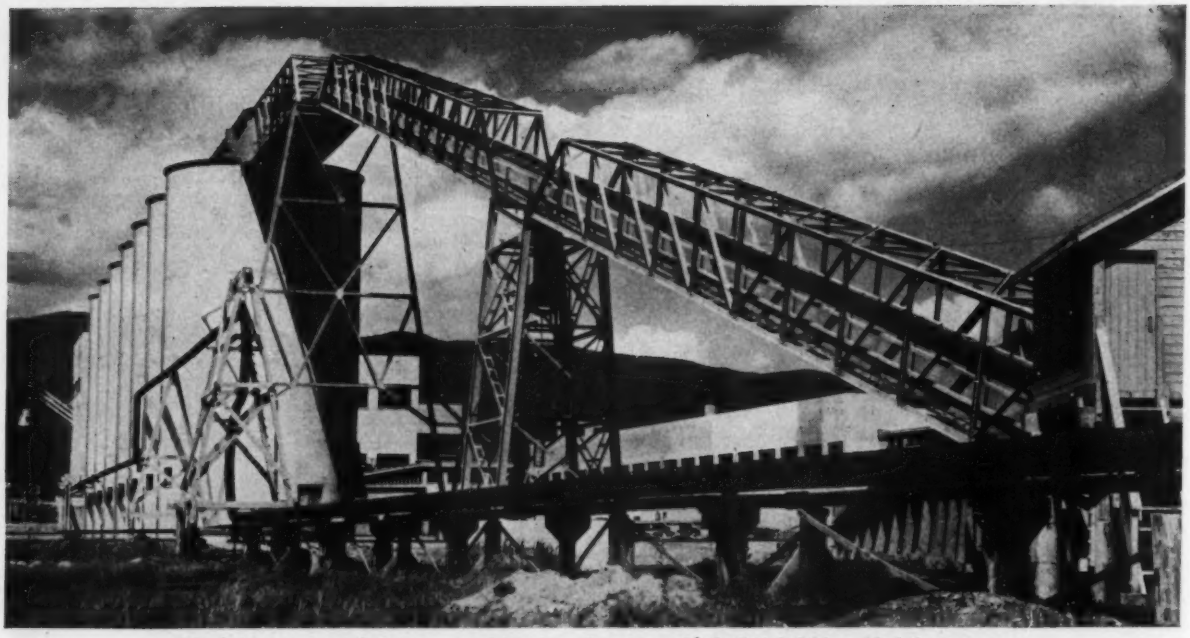
HOLYOKE, MASS., U.S.A.
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD



Wood chips are carried to six storage silos in a pulp mill on this Link-Belt 24-in. wide belt conveyor. Side rolls of idlers are set at 45° angle to permit the belt to carry a greater volume of chips per linear foot.

Rely on one source... one responsibility for the best in belt conveyors

LINK-BELT engineering experience plus quality components combine to cut handling costs

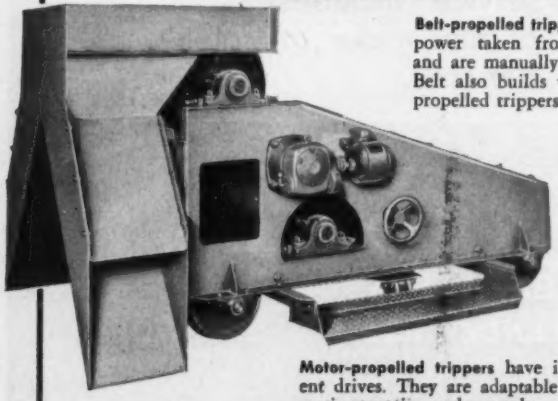
WHETHER you must move a few tons a day or several thousand tons per hour . . . whether the haul is measured in feet or miles—you'll find the answer in belt conveyors at Link-Belt.

Here's a nation-wide engineering organization that will follow through from start to finish—the designing, manufacturing, erecting of conveying equipment. And nowhere can you match Link-Belt's combination of vast application experience . . . complete line of quality components . . . expert coordination of related equipment.

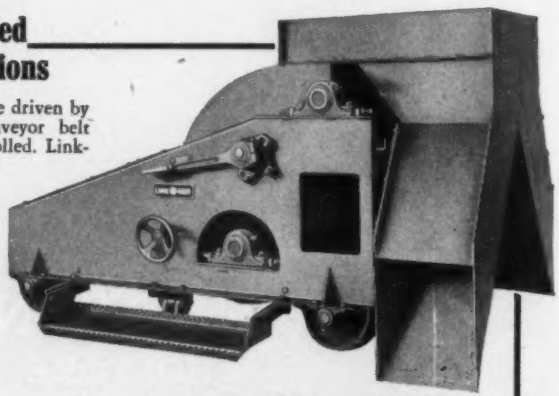
Get all the facts from the Link-Belt office near you. Link-Belt engineers are glad to work with you and your consultants—help you get the finest in belt conveyors.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, Duluth, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

LINK-BELT Trippers offer controlled distribution under all conditions



Belt-propelled trippers are driven by power taken from conveyor belt and are manually controlled. Link-Belt also builds winch-propelled trippers.



Motor-propelled trippers have independent drives. They are adaptable to automatic operation and control.

12,665-C

LINK-BELT

BELT CONVEYOR EQUIPMENT

The Paper Industry Association News

U. of Florida Announces First Annual Conference

The first annual Pulp and Paper Conference sponsored by the University of Florida was to be held September 8-12 at Gainesville. The program is sponsored by the pulp and paper labratory of the Department of Chemical Engineering.

Objectives of the conference are: (1) to develop broader technical knowledge in tour foremen who have already shown qualities of leadership; (2) to assist qualified tour foremen in acquiring such technical knowledge as is necessary for them to convey to the men reporting to them; (3) to increase the learning pace of recently employed technical men who do not have specific pulp and paper experience, and (4) to serve as a refresher course for mill administrators and operators.

Speakers listed for the conference are as follows: Franklin L. Jones, St. Joe Paper Co., Port St. Joe, Fla.; Rudolph C. Richter, St. Mary's Kraft Corp., St. Mary's, Ga.; E. A. Harper, Hudson Pulp & Paper Co., Palatka, Fla.; Malcolm Pineo, Brunswick Pulp & Paper Co., Brunswick, Ga.; Dr. W. J. Nolan, Pulp and Paper Laboratory, University of Florida; J. A. Berg, Hudson Pulp & Paper, Palatka; Steve Kennedy, Minneapolis-Honeywell Regulator Co., Jacksonville; Dr. Peter B. Borlew, Container Corp. of America, Fernandina Beach; Milton Roberts, St. Regis Paper Co., Jacksonville; and Dr. Wilson F. Brown, Pulp and Paper Laboratory, University of Florida.

U. of Maine-Tappi Meeting Features Statistics Study

About 36 research workers and quality control men in the paper industry attended a two-week conference on the application of statistics at the University of Maine, Orono, August 4-16. The conference was sponsored jointly by Tappi and the university.

The purpose of the conference was to give preliminary training in the use of statistical methods in research, production, and quality control. Instructors were Prof. Geoffrey Beall of the University of Connecticut and formerly of the Institute of Paper Chemistry; Dr. Charles W. Bicking of the Research and Ordnance Division, U.S. Army; Dr. Bary G. Wingersky, chief statistician in the Department of Market Research of Gillette Safety Razor Co., and Prof. Spofford H. Kimball, head of the University of Maine Department of Mathematics and Astronomy.

Am. Forestry Association Announces Annual Meeting

The American Forestry Association will highlight modern forestry practices at its annual convention, to be held October 12-15 at the Battery Park Hotel, Asheville, N.C. The meeting will be staged jointly with the North Carolina Forestry Association.

Among the speakers will be Dr. R. E. McArdle, chief of the U.S. Forest Service, who will discuss "Forests and Waters." Also on the program are to be two experts on southern forestry problems, Capt. I. F. Eldredge, consulting forester, New Orleans, and Norman A. Cocke, vice president of Duke Power Co., Charlotte, N.C. Participating in a panel discussion on the subject "Forests and Water" will be: Charles A. Connaughton, U.S.F.S., regional forester, Atlanta; Carlton J. Blades, chief forester of Duke Power Co.; George R. Ross, director of the Department of Conservation and Development, Raleigh; Bryce C. Browning, secretary-treasurer of the Muskingum Watershed Conservancy District, New Philadelphia, Ohio, and Dr. Henry A. Curtis, director of TVA, Knoxville.

Four field trips are planned for the meeting. These are to the Coweeta Hydrologic Laboratory, Franklin, N.C.; Great Smoky Mountains National Park and Cherokee Indian Village; Pisgah National Forest, Biltmore Plantations, and Champion Paper & Fibre Co., and to Mt. Mitchell State Park and Biltmore House and gardens.

Ohio Tappi Announces Partial 1952-53 Program

The program committee of Ohio Tappi has announced a partial program for the 1952-53 year. The committee held meetings at Miamisburg and Fort Ancient.

Speakers for the first two meetings, both of which are to be at the Manchester Hotel in Middletown are: Prof. Karl Fruedenberg of Heidelberg University, Heidelberg, Germany, who will speak on "Lignin Chemistry" at the September gathering; Dr. J. A. Van Den Akker of the Institute of Paper Chemistry, Appleton, Wis., who will speak on "Measurement of Color" in October. The dates will be announced later.

The November 18 meeting will be a joint gathering with the Superintendents Association. The program is to be staged in Middletown and will concern electric distribution systems in paper mills.

An inspection trip through Bauer Bros. and Crowell-Collier Publishing Co. at Springfield, to be followed by an address on "Rotogravure Printing," is planned for April 9. The final meeting will be a Ladies' Night at the Hartwell Club House in Cincinnati May 14.

Supts. to Present First Boyce Award

Fred C. Boyce, founder of the Superintendents Association, was to present the first of three student awards named in his honor on September 18. The occasion for the presentation was the first dinner meeting of the Michigan Division, to be held at the Hotel Harris, Kalamazoo.

Two other similar awards will be made in the immediate future—one to a pulp and paper student at the University of Maine, Orono, the other to a student at the College of Forestry, University of New York, Syracuse. The award, established last year as an annual gift of the Association, is a check for $200.

Technical Papers Featured at Penjerdel Meeting

Technical discussions on many aspects of paper manufacture were scheduled to be presented at the fall meeting of the Pennsylvania-New Jersey-Delaware Division of the Superintendents Association. The gathering is scheduled for September 26-27 at Galen Hall, Wernersville, Pa.

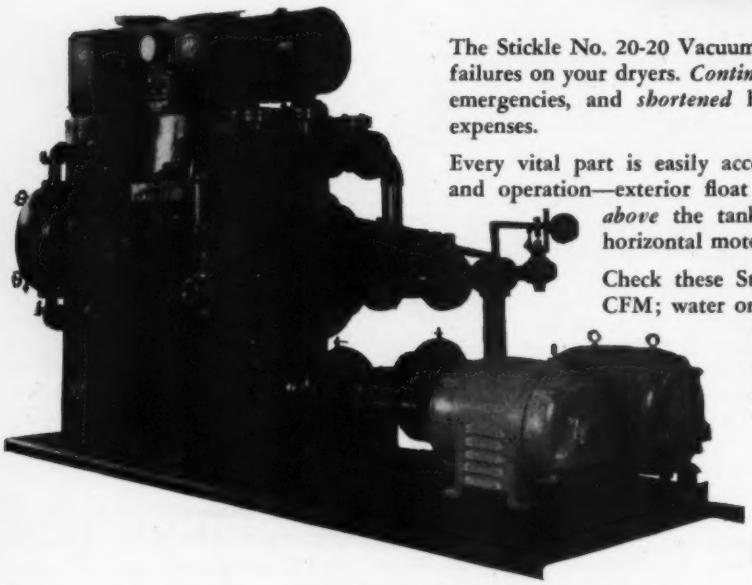
The titles of the papers, together with the respective authors, are: "Wastepaper Stock Cleaning and Refining," J. J. Verwayen, Gibraltar Corrugated Paper Co. Inc., North Bergen, N.J.; "Cylinder Machine Operation," O. P. Russell, Lowe Paper Co., Ridgefield, N.J.; "Meeting Current Trends in Board Specifications for Folding Cartons," Jo-

Favored by superintendents

. . . and management

Stickle Equipment

Cuts the cost of steam



The Stickle No. 20-20 Vacuum Pump eliminates costly pump and motor failures on your dryers. *Continuous* performance, *double* capacity during emergencies, and *shortened* heat-up periods mean reduced operating expenses.

Every vital part is easily accessible for easy, economical maintenance and operation—exterior float boxes, interchangeable vacuum chamber *above* the tank, built-in heat exchanger, and standard horizontal motor and pump.

Check these Stickle capacities: water, 50 GPM; air 55 CFM; water only, 150 CPM. *Double* these capacities for dual pump operation.

Check all the facts—facts of vital interest to the men on the job and management. Write for Bulletin No. 260 today!

STICKLE STEAM SPECIALTIES COMPANY

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seph J. Schwenkler, Container Corp. of America, Philadelphia (Manayunk), and "Superintendents' Non-Mechanical Aids," A. H. Haug, Scott Paper Co., Chester, Pa.

N. Y.-Canadian Supts. Announce Fall Meeting

The New York-Canadian Division of the Superintendents Association was to stage its annual fall gathering September 18-20 at the Saranac Inn, Upper Saranac Lake, N.Y. On the program in addition to technical papers were golf, trap shooting, bridge, and the annual banquet.

Speakers scheduled for the meeting included T. S. Morse, Hercules Powder Co.; Allen A. Lowe, Sandy Hill Iron & Brass Works, and Wesley Corbin, The Bagley & Sewall Co.

Northeastern Supts. Stage Fall Meeting

Four technical papers were featured at the 1952 fall meeting of the Northeastern Division of the Superintendents Association, held September 18-20 at the Poland Spring House, Poland Spring, Maine.

"Value of Instrumentation" was the subject of E. Andrews of Brown Instrument Co. A. E. Bachmann of Mississquoi Corp. talked on "Human Engineering." The two papers given by Oscar Anderson of International Paper Co., Chisholm, Maine, were "Value of Chip Testing" and "Influence of Chip Size on Pulping Variables."

The program included a "Headache Meeting" for clearing up individual mill problems where possible. An added feature was the awarding of the Fred C. Boyce Student Award, under the sponsorship of the national association, to a pulp and paper student at the University of Maine.

New Hardboard Process Described at FPRS Meeting

A description of the new Allboard process for making hardboard from resinous waste wood was to be presented by Dr. Arthur B. Anderson of the University of California at a meeting of the Forest Products Research Society in Milwaukee June 23. The title of his paper was "Utilization of Resinous Wood in Hardboard."

Unique feature of the new process, according to Blaw-Knox Co., is its use of the whole wood, thus increasing the utilization of forest and mill waste. It is also believed to be the first wood fiber hardboard process in which chemicals are not required for binders or sizing agents.

Also known as the Anderson-Lighthall process, the new technique was developed for and with the collaboration of Oregon Lumber Co. The first plant to use the process was designed and built by the Chemicals Plants Division of Blaw-Knox at Dee, Ore.

Association Notes

St. Regis Paper Co.'s
Foremen's Club at Deferiet, N.Y., has received the National Association of Foremen's "Standard of Excellence" award. The club is one of 16 in the country to receive the NAF presentation.

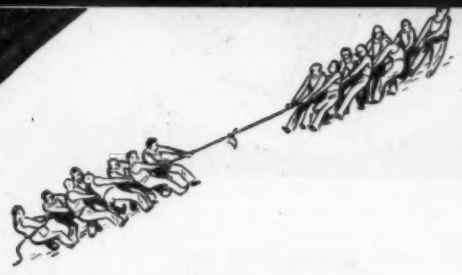
Lake Erie Section
of Tappi held its summer outing August 22 at Cleveland. Included in the program was a guided tour through American Greetings Corp., a buffet luncheon, golf and softball, and dinner.

Northwestern Supts.
staged their annual fall meeting September 12-13 at Green Bay, Wis.

Michigan Supts.
heard E. J. Ward, sales vice president of Cameron Machine Co., at their first meeting of the season September 18 at the Harris Hotel in Kalamazoo. He spoke on "Slitting and Roll Winding

HOOPERWOOD DRYER FELTS

S-T-R-E-T-C-H is no problem with Hooperwood Felts



To meet one of the paper maker's serious problems, Hooperwood Laboratories has perfected a *stabilized* felt. *Now,* you can expect your original seam to last as long as the felt. And with stretch under control, the problem of shrinkage in width disappears.

What this means in downtime saved, in production increased, can best be figured out by you. Add to it soft finish, superior drainage, high tensile strength—and you have a dryer felt worth specifying every time.

Hooperwood® Dryer Felts are made in a variety of types and weights, to fit the needs of the paper industry. The one shown here, S/AA, is of asbestos and cotton, ideal for the high-speed production of heavier grades. Consult us for your dryer felt requirements.

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Fundamentals." At the meeting Fred C. Boyce presented the first of three student awards named in his honor to a student in pulp and paper at Western Michigan College.

Philadelphia Paper & Cordage Assn.
was to stage its first fall meeting September 19 at the Bala Country Club.

Envelope Manufacturers Assn.
at its annual meeting elected Richard D. Rheutan, president of Union Envelope Co. of Richmond, Va., president for the 1952-53 year. George B. Moss of Western States Envelope Co., Milwaukee, was named vice president, and Roland R. Bliss, secretary-treasurer for many years, was continued in that office.

Coming Events

TAPPI Meetings

Sept. 25-27—Pacific Coast Section (joint meeting with the Pacific Coast Division, Superintendents Association, and the Pacific Coast branch Technical Section of CPPA), Empress Hotel, Victoria, B.C.

Oct. 13-16—Seventh Engineering Conference, Morrison Hotel, Chicago.

Oct. 27-28—Fibrous Agricultural Residues Conference, Northern Regional Research Laboratory, Peoria, Ill.

Nov. 5-6—Plastics Conference, College of Forestry, State University of New York, Syracuse.

Nov. 12-14—Sixth Annual Alkaline Pulping Conference, Battle Hotel, Mobile, Ala.

Nov. 18—Ohio Section (joint meeting with the Miami Valley Superintendents), Middletown, Ohio.

Nov. 20-21—Corrugated Containers Conference, Schroeder Hotel, Milwaukee.

American Pulp & Paper Mill Superintendents Association meetings

Sept. 25-27—Pacific Coast Division (joint meeting with the Pacific Coast Section of Tappi and the Pacific Coast branch Technical Section of CPPA), Empress Hotel, Victoria, B.C.

Sept. 26-27—Pennsylvania-New Jersey-Delaware Division (fall meeting), Galen Hall Hotel, Wernersville, Berks County, Pa.

Oct. 8-10—Southern and Southeastern Divisions (joint meeting), Hotel Roanoke, Roanoke, Va.

Oct. 11—Connecticut Valley Division (fall meeting), Berkshire Inn, Great Barrington, Mass.

Nov. 18—Miami Valley Division (joint meeting with the Ohio Section of Tappi), Middletown, Ohio.

June 9-11—National meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

Other meetings

Oct. 12-15—American Forestry Association, annual convention (joint meeting with the North Carolina Forestry Association), Battery Park Hotel, Asheville, N.C.

Oct. 13-16—Printing Industry of America, Chase Hotel, St. Louis.

Oct. 13-16—Society of Industrial Packaging and Materials Handling Engineers, annual short course, Chicago.

Oct. 20-22—Packaging Institute, annual forum, Hotel Commodore, New York, N.Y.

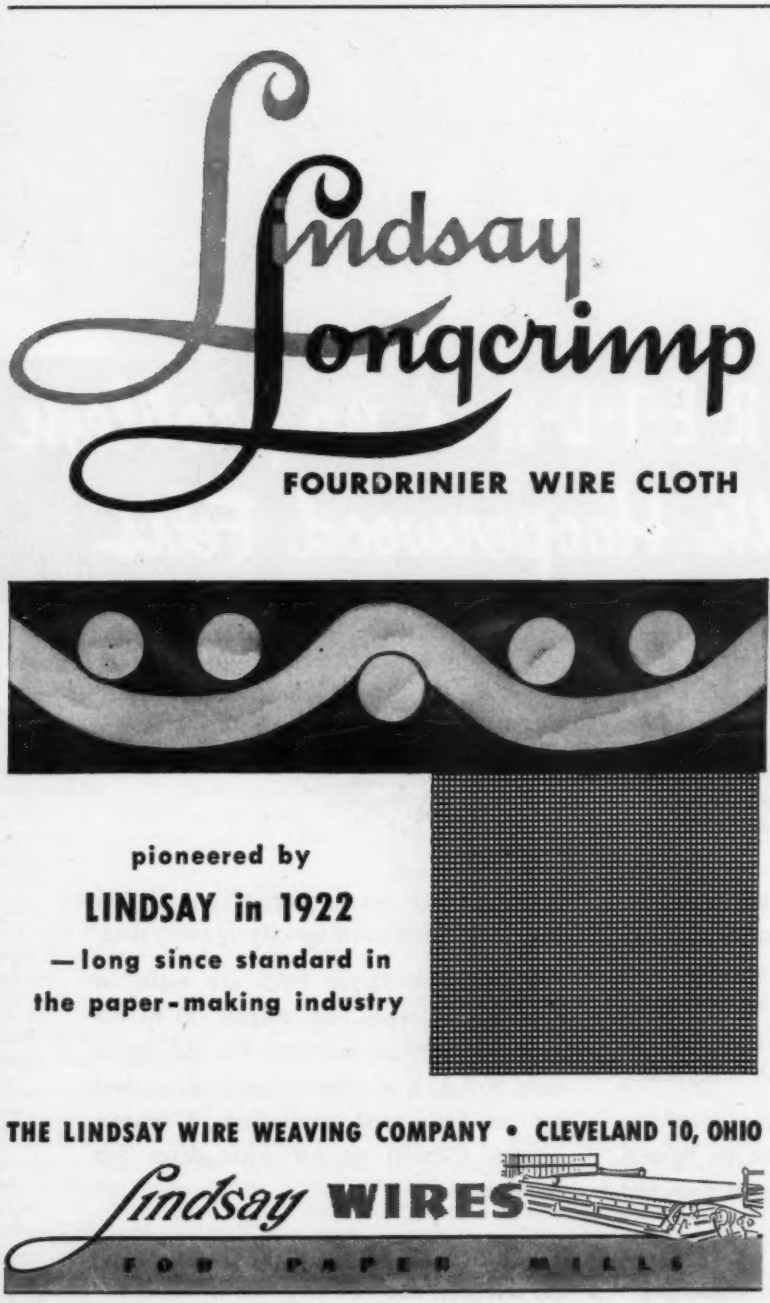
Oct. 30-31—National Paper Trade Association, fall meeting, Edgewater Beach Hotel, Chicago.

Nov. 5-7—Industrial Management Society, Sixteenth Annual Time and Motion Study and Management Clinic, Sheraton Hotel, Chicago.

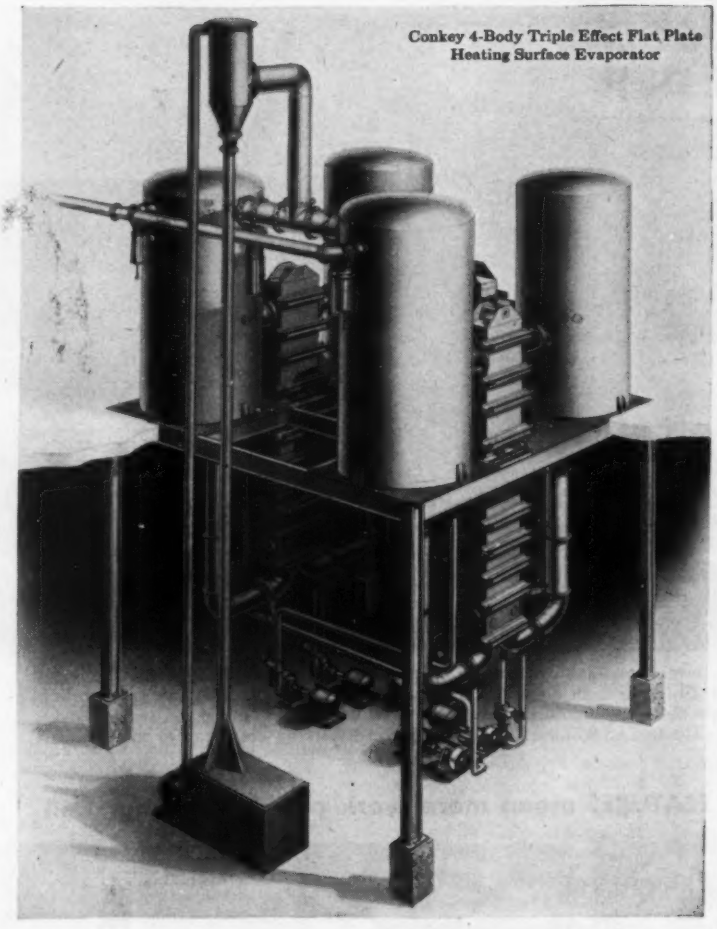
Dec. 1-6—Twentieth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, N.Y.

Dec. 7-10—American Institute of Chemical Engineers, annual meeting, Cleveland Hotel, Celeveland.

Jan. 28-30—CPPA Technical Section, Mount Royal Hotel, Montreal, P.Q., Canada.



NO shut down time! stream pollution! scale removal costs!



Conkey 4-Body Triple Effect Flat Plate Heating Surface Evaporator

Conkey Flat Plate Heating Surface Evaporator *with Rosenblad Switching System**

The proven system for avoiding stream pollution by sulphite pulp mill waste liquors that proved so outstandingly successful in commercial installations all over Scandinavia, is now adapted for use in this country by General American. *In every instance* where a Rosenblad Switching System has been installed, shut down time *and* scale removal *costs have been practically eliminated!* The Rosenblad System utilizes the condensate wash as a descaling operation carried on during full capacity operation of the evaporator. Surfaces subjected to boiling liquor are periodically switched with those in contact with vapor and condensate to clean heating surfaces during normal continuous operation. *Every part* of the equipment is switched, consequently scale is washed away from pipe lines, valves and vessels . . . in addition to heating surfaces.

At present in this country . . . Rosenblad Switching Systems in Conkey Flat Plate Heating Surface Evaporators are being constructed for full scale commercial operations. *Write today for detailed bulletin.*

*Patents Applied For

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Turbo-Mixers, Filters, Dewaterers, Dryers, Towers, Tanks, Bins, Pressure Vessels

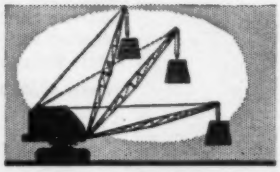
Link-Belt Speeder Cranes mechanize pulpwood handling

Speed work by 250% to 1000%

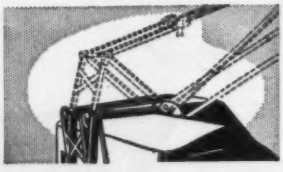
P. H. GLATFELTER CO., Spring Grove, Penn., owns three Link-Belt Speeder Cranes—an LS-90 and two LS-85's. Unloading incoming trucks and flatcars, the LS-90 removes 2½ cords from a truck in 5 minutes . . . 14 to 16 cords from a flatcar in 30 minutes. Previously, it took 55 minutes for two laborers to unload an average truckload on to a ranked pile . . . an hour and 15 minutes for six laborers to unload a boxcar. The two LS-85's feed conveyors to the de-barking drum and to the chipper —also stockpile.

These Link-Belt Speeder PLUS FEATURES mean more work per day at your mill

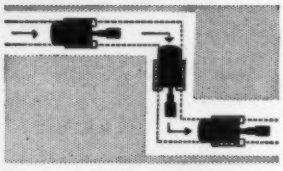
All-Welded Lower—extra strength without extra weight. Resists impact and twist. Field service simple, fast.



Independent Boom Hoist—controlled power *down* as well as up. *Safer,* faster. Boom, hoist, swing simultaneously or independently.



Patented Retractable Gantry—for fast, safe on-the-job handling of long booms. Raise, lower under power. Simple, fast.



Turns on a Dime. Either track can drive or be locked independently. Digging brakes controlled from cab.

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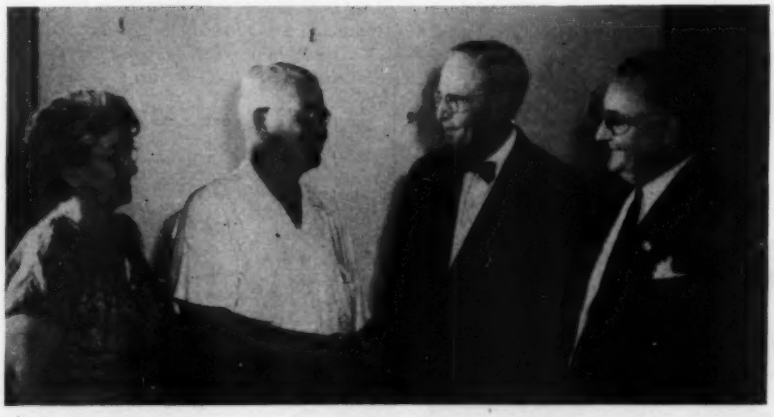
The Paper Industry Names in the News



RETIRING AFTER A HALF-CENTURY OF SERVICE as a roll grinder at Manchester Machine Co., Middletown, Ohio, a subsidiary of Gardner Board & Carton Co., Stanley (Pete) Ward (second from left) is congratulated by President E. T. Gardner, following the presentation of a diamond-studded 50-year service pin. Looking on are Mrs. Ward and Manchester Superintendent Henry Alford

Pabco Products Elects William L. Keady President

WILLIAM L. KEADY, former president of United States Gypsum Co. and Marathon Corp., has been elected president and director of Pabco Products, Inc. *WILLIAM H. LOWE*, Pabco president, has been promoted to chairman of the board, replacing *RICHARD S. SHAINWALD* who became honorary board chairman.

Mr. Keady joined United States Gypsum in 1924, becoming production manager in 1928, vice president in charge of operations in 1932, and president in 1942. In 1949 he resigned to become president of Marathon Corp. He is also a director of the City National Bank of Chicago.

Mr. Lowe joined Pabco Products in 1904 and was made president in 1936. Mr. Shainwald has been with the company 60 years, having joined the firm as a bookkeeper in 1892. He was elected president in 1928 and chairman in 1936.

Marathon Announces Four Personnel Changes

R. T. STEEDMAN has been appointed vice president and general manager of Marathon Paper Mills of Canada Ltd., Toronto. Mr. Steedman previously was vice president and resident manager of the Mill Division at Marathon, Ont. Before coming to Marathon in 1947, he had been associated with Abitibi Pulp & Paper Co., Anglo-Canadian and Anglo-Newfoundland Pulp & Paper Companies, and Ontario Paper Co.

H. P. KLINESTIVER, head of the Pic Woodlands Division at Port Arthur, is retiring to a consulting capacity. He has been with the company about 10 years. Succeding him will be *P. V. LeMAY*, who started with Marathon in 1944, and since 1946 has been operating manager of the Pic operation. *GRANT ROSS* has been named manager of the Mill and Townsite divisions at Marathon, Ont. Associated with Marathon since 1943, he was chief engineer of the kraft mill until 1946, when he was named mill manager.

George Bruyn Appointed Chief of NPA Section

GEORGE J. BRUYN, manager of the Niagara sales office of Hooker Electrochemical Co., has been appointed chief of the alkalies section, inorganic and agricultural chemicals branch of the Chemical Division, NPA, effective August 1. He has been granted a leave of absence and will remain in Washington until April 1, 1953.

Two Hooker chemical engineers, *JOHN T. WALMSLEY* and *FREDERICK W. BONACHER JR.*, have been transferred to the sales coordination office of the sales department at Niagara Falls, N.Y.

Hooker also announces the appointment of *HORACE W. HOOKER JR.* as assistant to the general sales manager, *PETER N. MACLAREN* as purchasing agent, to succed Mr. Hooker, and *ROBERT F. SCHULTZ* as assistant technical superintendent.

Strattner Returns to W. Va. Pulp & Paper Co.

LAWRENCE W. STRATTNER, who has been assistant administrator in charge of the Chemical, Rubber and Forest Products Bureau of the NPA since April 1952, is returning to his position as administrative vice president of West Virginia Pulp & Paper Co., New York City. According to Henry H. Fowler, administrator of the NPA, Mr. Strattner is to be succeeded by *FRED W. FRALEY*, who became deputy assistant administrator for the Bureau in May 1952.

During World War II, Mr. Strattner was a member of several government industry advisory committees and served on the War Production Board's pulp allocation committee. He has been associated with West Virginia Pulp & Paper since 1916, serving in various production capacities at a number of the company's plants.

Mr. Fraley, a vice president and member of the board of directors of Diamond Alkali Co., Cleveland, joined NPA in March 1952 as an assistant director of the Chemical Division. During World War II, he was a member of WPB and Munitions Board industry advisory committees. He has also served on the NPA Alkali-Chlorine Industry Advisory Committee. He is a director and vice president of Chlorine Institute Inc.

Stocker New KVP Pres.; Succeeded at Michigan Paper by Milham

DWIGHT L. STOCKER has been elected president and general manager of Kalamazoo Vegetable Parchment Co., succeeding *ALFRED SOUTHON*, who

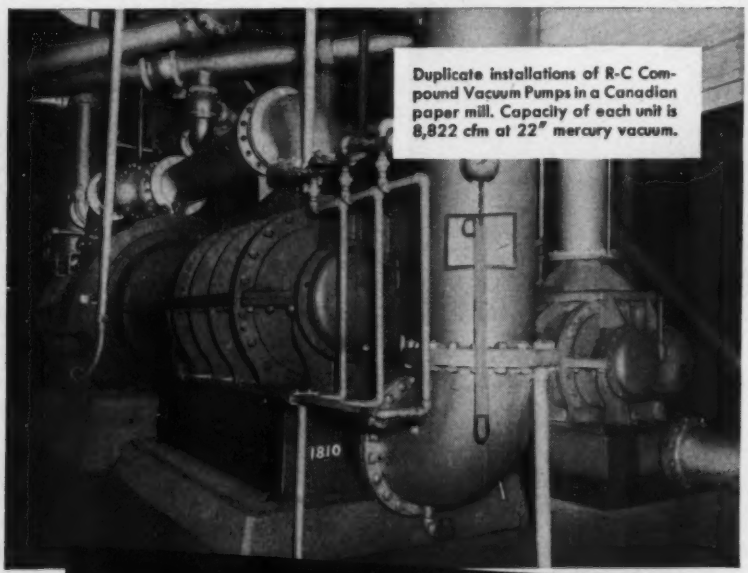
becomes chairman of the board. It is expected that the complete operative change will not be made before October 15.

Replacing Mr. Stocker as president of Michigan Paper Co. at Plainwell is *ALLAN B. MILHAM*, who has been a member of the Michigan Liquor Control Commission since 1951. Mr. Milham was president of Bryant Paper Co. until his resignation in 1946, when the firm was purchased by St. Regis Paper Co.

Mr. Stocker, a graduate of Yale University, began his career as an employee of an Oregon logging company. For five years he was associated with Bryant and later with Hawley Paper Co., Oregon City, Ore. His next position was with Detroit Sulphite Pulp & Paper Co., where he was vice president in charge of production. In 1935 he joined Michigan Paper as general manager, becoming president in 1936.

Mr. Southon as the new KVP chairman of the board steps into a post that has been vacant since the death of the founder of the company, Jacob Kindleberger, in 1947. Celebrating his 40th year with the firm last month, he became superintendent of the mill in 1915 and in 1924 was made sales manager. He was appointed vice president and a member of the board of directors in 1936 and 10 years later became executive vice president. Mr. Southon was elected president and general manager in 1951.

The son of one of the founders, Mr. Milham joined Bryant Paper Co. upon graduation from college in 1916. After service in World War I he returned to the firm, where he served in various capacities throughout the mill. He was made manager of the Imperial Division coating department in 1935 and vice president and manager in 1942. Upon his resignation as president in 1946, he entered the municipal government at Kalamazoo, serving both as city commissioner and vice mayor.



Duplicate installations of R-C Compound Vacuum Pumps in a Canadian paper mill. Capacity of each unit is 8,822 cfm at 22" mercury vacuum.

LESS WEIGHT...LESS FLOOR SPACE with R·C Vacuum Pumps

Compactness of the simple rotary positive design of Roots-Connersville Vacuum Pumps, together with higher operating speed (600 rpm), bring substantial reduction in weight and floor space for any required capacities. This means lower installation costs.

You save on motors and power, too. In a specific case, motors cost $20,000 less. In another, 200 less motor horsepower was called for.

These cost reductions would be useless, however, without the long-proved reliability and low maintenance of R-C equipment. Combined, these advantages explain why so many paper manufacturers are calling upon Roots-Connersville for their pump requirements. Ask for details in Bulletin 50-B-13 and consult us on your problems.

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ROOTS-CONNERSVILLE BLOWER
A DIVISION OF DRESSER INDUSTRIES, INC.

Alfred Southon

Dwight Stocker

Allan Milham

Richard Temple

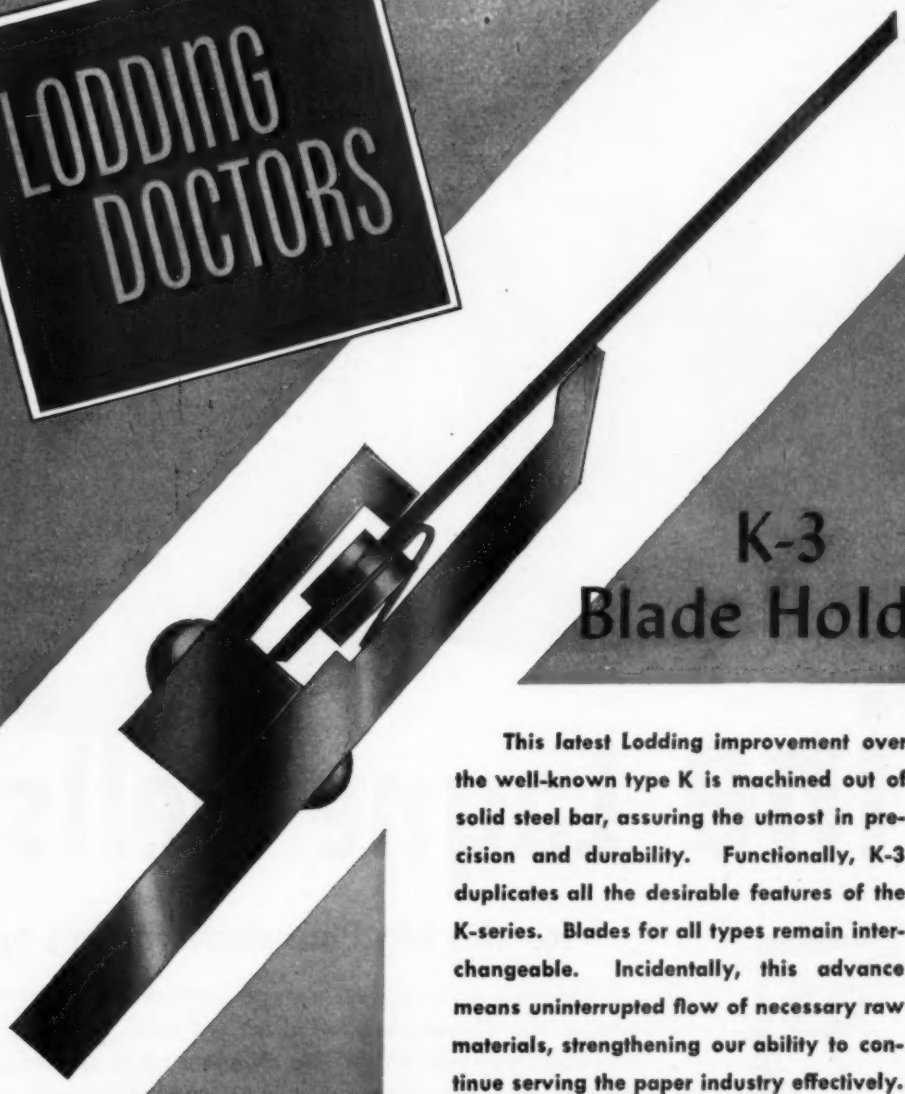
RICHARD U. TEMPLE has joined the sales engineering staff of Valley Iron Works Co., Appleton, Wis. He is widely known in the pulp and paper industry, having previously been associated with Downingtown Manufacturing Co. and with Moore & White.

Riis Succeeds Friend at International

J. H. FRIEND, vice president of International Paper Co. and general manager of its Southern Kraft Division, has resigned. However, he will continue to serve as a member of the board of directors and will be available in a consultant capacity on special projects. Succeeding Mr. Friend as general manager of the Southern Kraft Division will be *ERLING RIIS*, vice president and assistant general manager.

Mr. Friend, a native of Wisconsin, became associated in March 1924 with the late R. J. Cullen and joined International in 1927 when the Louisiana Pulp & Paper Co., Bastrop, La., was

LODDING DOCTORS



K-3
Blade Holder

This latest Lodding improvement over the well-known type K is machined out of solid steel bar, assuring the utmost in precision and durability. Functionally, K-3 duplicates all the desirable features of the K-series. Blades for all types remain interchangeable. Incidentally, this advance means uninterrupted flow of necessary raw materials, strengthening our ability to continue serving the paper industry effectively.

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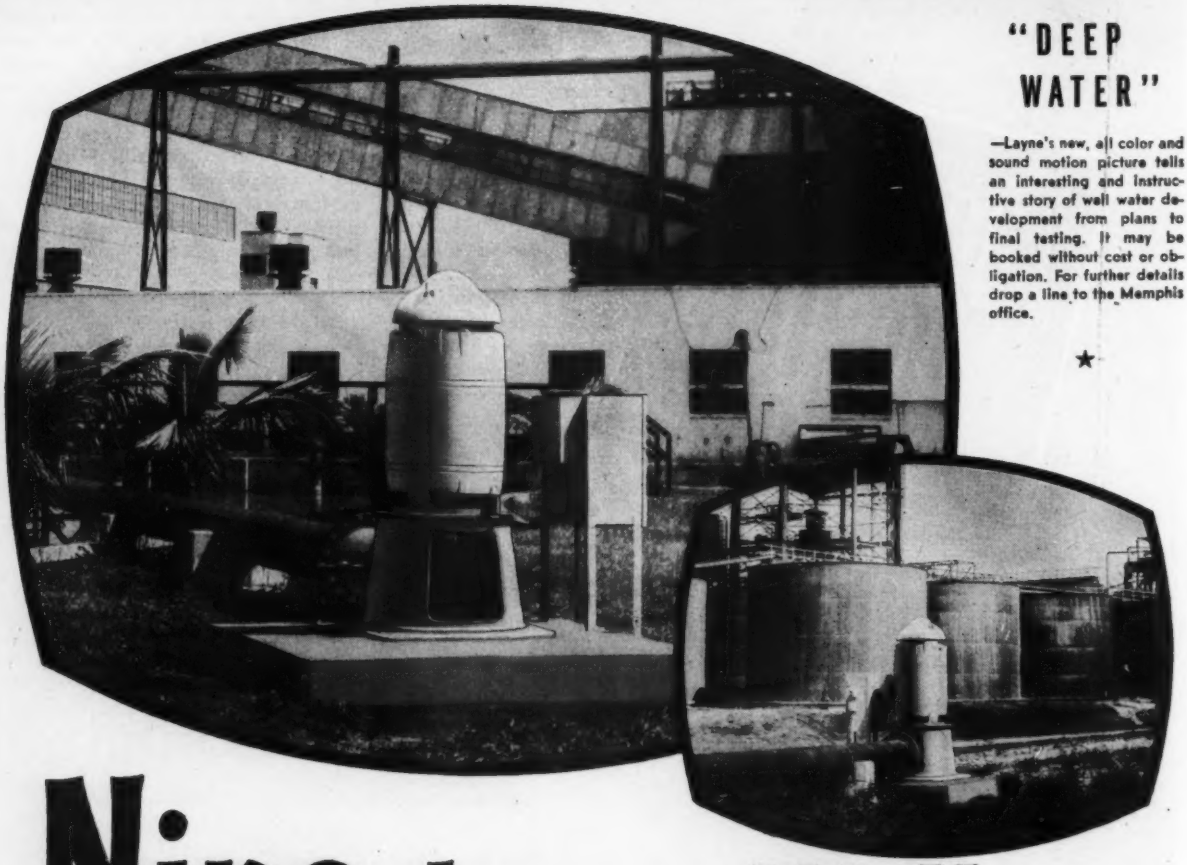

"DEEP WATER"

—Layne's new, all color and sound motion picture tells an interesting and instructive story of well water development from plans to final testing. It may be booked without cost or obligation. For further details drop a line to the Memphis office.

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Nine Layne Wells

for this big Phosphate mining operator

Phosphate mining presents many unusual problems, one of which necessitates an ever dependable supply of low cost water. International Minerals & Chemical Corporation, on their big phosphate mining operations near Bartow and Orlando, Florida, are now using nine complete Layne well and pump units. These installations have a total maximum capacity of nearly thirty-thousand gallons of water per minute—enough for greatly increased mining activity.

If you are contemplating the installation of water wells or pumps, it will be worth your while to have copies of our water supply or pump catalogs. Write for copies. No obligation.

And so here again we have a case of where water supply failure would stop everything—and where the owner had to be sure that he was buying the utmost in proven dependability, low cost operation and the kind of quality that would assure long life.

But the decision was easy. Layne water supply wells and pumps have an unmatched record of making good on every job no matter how heavy the production, or how long the hours may be. Whether for a mining operation, a city, factory or irrigation farm, Layne wells and pumps always give complete satisfaction and cost less in the long run.

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WATER WELLS
VERTICAL TURBINE PUMPS
WATER TREATMENT

purchased. In 1930, when the Southern Kraft Division was formed, he was appointed general manager. He was elected to the board of directors in 1939 and in 1941 was appointed a vice president.

Mr. Riis was born in Christiana, Norway, and received his education in that country, graduating as a mechanical engineer in 1909. He was elected to the board of directors in 1942, and in 1946 he was elected a vice president of International.

Harry Hayes Retires From St. Croix

Associated with St. Croix Paper Co., Woodland, Me., for more than 40 years, *HARRY L. HAYES*, vice president and general manager, retired as of August 1. However, he will continue to serve as a director of the company.

Mr. Hayes, a native of Exeter, N.H., was graduated from the University of New Hampshire in 1905 with a degree in electrical engineering. He was employed by General Electric Co. for six years before joining St. Croix in 1911. He was advanced to the position of assistant general manager in 1936 and became vice president and general manager in 1945. He was elected a director of the company in 1949.

Lewis New Dept. Head at Lowell Textile Institute

JOHN LEWIS of Brewster, Me., has been appointed head of the Department of Paper Engineering at Lowell Textile Institute, President Martin J. Lydon has announced. Mr. Lewis succeeds *DR. GEOFFREY BROUGHTON*, who was to become a member of the staff of the University of Rochester this month.

Mr. Lewis was graduated from the University of Maine in 1943 with the degree of Bachelor of Science in chemical engineering. In 1946 he became an instructor in the Department of Chemical Engineering at Maine and received his Master's degree in chemical engineering from the university in June 1948. In September 1949 he became an assistant professor at the university.

Mr. Lewis has served as laboratory technician for Penobscot Chemical Fiber Co., Great Works, Me., and as paper testing engineer for Eastern Corp., Brewer, Me. He is an active member of the Technical Association of the Pulp and Paper Industry and the American Institute of Chemical Engineers. He is a registered chemical engineer with the Maine State Board of Registration for Professional Engineers.

MARVIN GREENWOOD has been appointed a vice president of Celotex Corp. He has been general sales manager since 1939 and will continue in that capacity. Mr. Greenwood has been associated with the company since 1925.

Jesse Cummins

Gerald Conroy

JESSE CUMMINS, production superintendent at the Syracuse Carton Division of United Board & Carton Corp., has been promoted to general superintendent in full charge of all operations at the Syracuse unit. *GERALD CONROY* has been appointed assistant superintendent; *ERNEST BLESSING* has been placed in charge of the engineering department; and *HOMER MARTIN* of the sales department has been promoted to regional sales manager, with headquarters at the Syracuse plant.

Hinde & Dauch Paper Co. of Canada Ltd., Toronto, has announced the following appointments: *L. F. WINCHELL*, president and general manager; *TRACY E. LLOYD*, vice president; *H. H. McARTHUR*, vice president for sales; *WILLIAM H. PALM*, vice president for production; *R. S. KELLOW*, treasurer; *WILLIAM PFEIFFER*, secretary; *H. L. GEE*, assistant secretary, and *A. LYLE FORD*, assistant treasurer.

PERCY M. FOX, president of St. Lawrence Corp., has been elected a director of Dominion Tar & Chemical Co. Ltd., Montreal.

DONALD PAGE, sales engineer at Hudson Sharp Machine Co., Green Bay, Wis., has been appointed assistant to Vice President L. P. Bourgeois. He will cover sales in the states of Wisconsin, Illinois, Missouri, Iowa, and Minnesota. Mr. Page has been associated with the company since 1942.

Donald Page

R. M. Bode

Simultaneously, with the introduction of a new line of forged steel valves, Ladish Co., Cudahy, Wis., announces the appointment of *RICHARD M. BODE* to an executive sales position in its valve and fittings division. Formerly with Tri-Clover Machine Co. as vice president and sales manager, Mr. Bode will be responsible for the marketing of the newly introduced valve line.

Two Canadian pulp and paper company officials were among those receiving honorary Doctor of Law degrees at the commencement exercises of the University of New Brunswick, Fredericton. They are *VERNON E. JOHNSON*, vice president and general manager of Canadian International Paper Co. and *R. L. WELDON*, president and managing director of Bathurst Power & Paper Co., Ltd.

RICHARD SOUTH has joined Atlas Mineral Products Co.'s sales department. He is to be concerned with the sale of corrosion resistant materials and related products in southern Ohio, West Virginia, and Kentucky.

ALBERT G. NATWICK has been appointed director of the Pulp, Paper and Paperboard Division of NPA, according to Philip M. Crawford, regional director of the Department of Commerce—NPA in Seattle. Mr. Natwick is on leave from Crown Zellerbach Corp., Camas, Wash., where he is assistant resident manager.

WALTER THAD McDANIEL has been appoited industrial relations manager for Rayonier Inc., Southeast operations, with offices at Jessup, Ga. Before joining Rayonier, Mr. McDaniel was executive secretary to Senator Walter F. George.

Brown Co., Berlin, N.H., announced that *WENTWORTH BROWN*, vice president and assistant to the president, is now in charge of coordinating the efforts of research, sales and production in the development of new products and long-term manufacturing policy for the company. *R. W. ANDREWS*, who recently was made assistant to the president, will assume direction of the various departments of the Berlin operations previously reporting to Mr. Brown.

JOHN F. SENSENBRENNER, former director and vice president of Kimberly-Clark Corp., Neenah, Wis., has been re-elected to fill the position of director previously held by his father, the late F. J. Sensenbrenner. He had been with the firm for 35 years until 1942, serving as vice president of sales from 1927 until 1942, when he resigned to accept a commission in the army.

Alaska Pine & Cellulose Ltd., Vancouver, B.C., has made the following changes in its organization: *E. DELUCA* has been made assistant to the general manager at the Vancouver offices of the

Cellulose Division; *R. H. RICHMOND* has been made plant manager at Port Alice, succeeding *P. McGHEE*, and *J. FRASER* has been appointed mill superintendent at Port Alice.

JAMES P. LEWIS, president of J. P. Lewis Co. and Latex Fiber Industries, Beaver Falls, N.Y., has been elected to the board of directors of Niagara Mohawk Power Corp.

Hooker Electrochemical Co., Niagara Falls, N.Y., has announced recent appointments in its engineering department. *DR. EUGENE T. MILLER*, formerly with National Aniline as an electrical engineer, has joined the staff, as has *ALFRED W. TOON*. Mr. Toon, who will serve as a designing engineer, has been a draftsman, maintenance engineer, structural engineer and plant engineer in the chemical, paper, and metallurgical industries. Hooker has also announced the appointment of *HERBERT K. HOLDEN* as a salesman in the Niagara sales territory.

JOHN W. MALONEY, vice president and sales manager for Hoberg Paper Mills, Inc., Green Bay, Wis., has resumed his duties with the firm after one year's service with NPA in Washington, D.C. He became chief of the Sanitary Paper Division of NPA in 1951 and last June was appointed director of the Pulp, Paper and Board Division.

Three veteran employees of Hammermill Paper Co., Erie, Pa., celebrated anniversaries in July after a total of 125 years with the firm. They are *EDWARD FLETCHER*, purchasing agent, 45 years; *CHARLES B. MILNER*, personnel director, 40 years, and *EUGENE KUHN*, telegraph operator, 40 years.

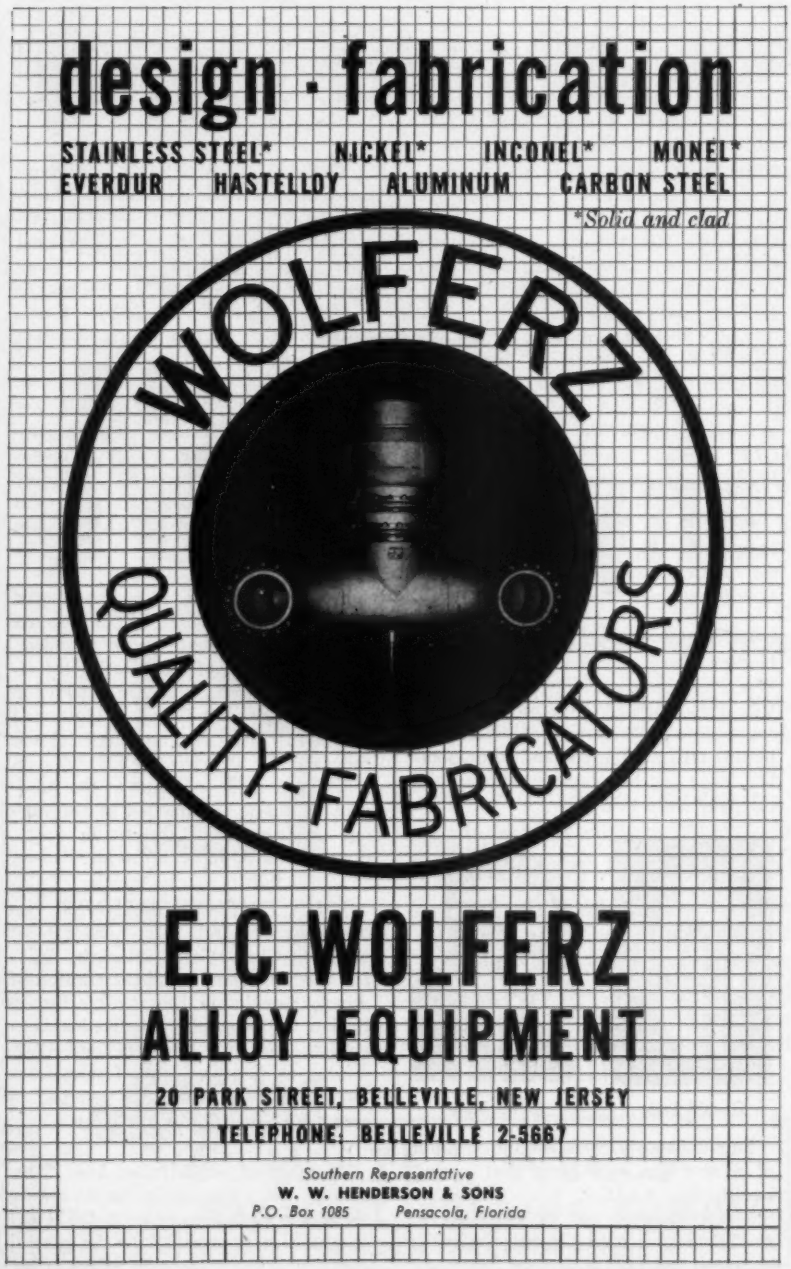
HENRY HUENING retired July 3 after 37 years service in the board mill beater rooms of Gardner Board & Carton Co. at Lockland, Ohio.

Spruce Falls Power & Paper Co. Ltd., Toronto, has announced the following appointments: *GEORGE BARBER*, vice president; *LAWRENCE W. KERR*, secretary-treasurer; *THOMAS H. STEVENS*, assistant secretary-treasurer, and *ROBERT S. WALKER*, service operations superintendent at Kapuskasing, Ont.

J. C. HAIR, formerly production manager, has been made manager of Crossett Paper Mills, Crossett, Ark., to succeed K. O. Elderkin. Mr. Elderkin has resigned to supervise construction of the $50,000,000 paper mill being built by Bowaters Southern Corp. in Tennessee. *D. B. KUHE*, former assistant manager, has been placed in charge of planning and development. *C. W. SMITH* has been promoted from plant engineer to production manager and *R. Q. CONNER* named to succeed him.

Olin Industries, Inc., New Haven, Conn., has announced six key appointments. *DR. HERMAN A. BRUSON*, polymer chemist formerly with Industrial Rayon Corp., has been made manager of the organic research department in the general research organization. *DR. CHARLES H. HOFRICHTER JR.* was made research section chief; *DR. WILLIAM E. MYDANS*, in charge of evaluating marketable values of film properties; *FRED H. OLSEN*, in charge of packaging development; *S. JACKSON WOMMACK JR.*, film development section chief, and *MICHAEL KARELITZ*, chief of the engineering section.

Minneapolis-Honeywell Regulator Co. has named seven regional industrial sales managers. They are: *JACK E. MacCONVILLE*, Atlanta; *ALFRED J. McCULLOUGH*, Cleveland; *HOWARD L. MARSTON*, Minneapolis; *ROBERT L. MALLORY*, Dallas; *ROBERT B. GRANT*, Los Angeles, and *LESTER W. WILLIAMS*, Portland.



Typical wool showroom, where buyers make their selections.

Photographs courtesy of Wool Bureau, Inc.

Out Where Huyck Felts Begin

First, the fleece. From 1,500 classified types, buyers choose only those special wools that meet the exacting requirements of Huyck Felts. In the principal wool-growing countries of the world this discriminating selection goes on. For these must be just certain wools, rare and costly.

In they come, to the great wool warehouses at Rensselaer, New York. From this vast supply, skilled sorters select the grades specified for each type of felt, then blend them for the precise task the felt is to perform on the paper machine.

This is the first, and only the first step in making the famous Huyck felts which for 82 years have rendered such essential service to the pulp and paper industry.

KENWOOD TEXTILE PRODUCTS

HUYCK *Felts*

F. C. Huyck & Sons — Kenwood Mills — Rensselaer, N. Y.

Have you a dust recovery problem?

Bring it to WESTERN PRECIPITATION

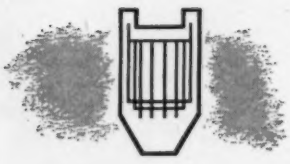
... The Only Organization With Years Of "Know-How" In BOTH *Electrical* And *Mechanical* Recovery Methods!

If you have any kind of a suspension-recovery problem—whether dust, fly ash, fume, fog or mists—it will pay you to bring it to the leading organization in the field ... WESTERN PRECIPITATION CORPORATION. Western Precipitation not only pioneered, over 44 years ago, the first commercial application of the now-famous COTTRELL Electrical Precipitators, but also has been a leader for many years in the *mechanical* recovery field with its widely-accepted MULTICLONE Collectors.

Result:

Western Precipitation is unsurpassed in the all-important factor of "know-how" in BOTH the electrical and mechanical fields ... knows from years of first-hand experience whether your particular problem can best be solved by mechanical or electrical methods—*or by a combination of the two* ... can give you a direct and unbiased recommendation on the matter ... and then can provide the complete installation under *one* responsibility, *one* overall performance guarantee, even where Combination Multiclone-Precipitator (CMP) installations are made!

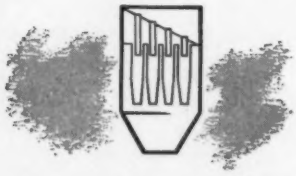
Western Precipitation products and services include ...



COTTRELL

Electrical Precipitators

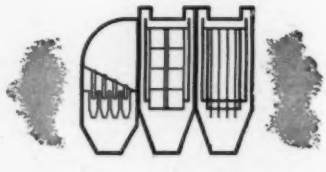
... the most efficient recovery equipment for high recovery, long life, low maintenance on practically any type of suspensions, wet or dry. COTTRELLS can be designed to handle a few c.f.m. —or millions—with equal ease, and at virtually any operating temperature. Recovery efficiencies closely approach 100% recovery, if desired, with very low draft loss, minimum power costs and negligible labor costs. *By all standards, Western Precipitation COTTRELLS give highest recovery at lowest cost per-year-of-service!*



MULTICLONE

Mechanical Collectors

... the most efficient, most compact, most trouble-free mechanical equipment for recovering suspensions from gases. Because of their unique small-tube design, MULTICLONES are unsurpassed in mechanical recovery efficiencies—require less space, less maintenance, and are far simpler to install. No filters or screens to replace, nothing to burn or cause fire hazards, no high speed moving parts to repair or replace. These and many other advantages make MULTICLONE Collectors the logical choice on installations where mechanical recovery is selected.



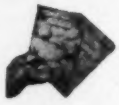
CMP UNITS

(Combination Multiclone-Precipitator)

... combine, in *one* compact installation, *both* mechanical and electrical recovery principles so that maximum benefit is obtained from the advantages inherent in each method. The MULTICLONE section centrifugally removes the larger and heavier suspensions (down to a few microns in diameter) ... and the COTTRELL section then electrically removes the very small particles remaining in the gases. Thus, the bulk of the recovery is obtained with relatively low-cost equipment, and the final clean-up is obtained with equipment having unusually high recovery efficiency—approaching theoretically perfect, if desired.

The recovery of suspensions from gases is a highly exact science and every problem is different. Some require mechanical methods—others electrical methods—still others a combination of mechanical and electrical methods in proper balance to meet the individual requirements of each application. No matter what your problem, remember that only Western Precipitation has had years of field experience in BOTH mechanical and electrical methods!

Send for descriptive literature!



Let our experienced engineers study your recovery requirements and make an unbiased recommendation on the equipment best suited to your particular problem. A wire, phone call or letter to our nearest office places this unique "know-how" at your service, without obligation.

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MULTICLONE—T.M. Reg.

The Paper Industry Safety News

PROUDLY DISPLAYING safety awards won by LongLac Pulp & Paper Co. Ltd., D. C. Porter, mill manager, and Dan Gillis, president of Local 665, meet with J. Fred Berry of Alton Box Board Co. (left) and Fred O. Soughton, services and safety supervisor for LongLac

LongLac Wins Two National Safety Council Awards

LongLac Pulp & Paper Co., Terrace Bay, Ont., received two National Safety Council Awards at special ceremonies staged August 1 at the mill. At the presentation the company officially accepted a Certificate of Achievement and an Award of Merit. The awards were made by J. Fred Berry, a past general chairman and member of the NSC Pulp and Paper Section's executive committee.

LongLac's accident prevention experience at Terrace Bay was of such nature during 1951 that it was recognized by the NSC under a new plan set up by its Industrial Conference. The company qualified for the Award of Merit (second highest award now given by the Council) with a frequency rate of 3.5—72 per cent better than par—and a severity rate of 0.11, which bettered par by 90 per cent. The award was accepted for LongLac by D. C. Porter, mill manager.

The Certificate of Achievement was won in the 1951 Paper Industry Safety Contest sponsored by the NSC. It was accepted by Dan Gillis, president of Local 665, International Brotherhood of Pulp, Sulphite and Paper Mill Workers.

The proceedings included the raising of the Award of Merit pennant on the company's bulletin board flagpole. Following the ceremony Award of Merit key chains were distributed to all Long-Lac employees. Master of ceremonies was Fred O. Soughton, the firm's services and safety supervisor.

M. G. Hoyman Retires from Kimberly-Clark

M. G. Hoyman has retired as director of building services for Kimberly-Clark Corp., Neenah, Wis. He had served the firm 33 years, 19 of them as safety director.

Mr. Hoyman began his work when he was chosen by S. F. Shattuck to start the integrated accident-prevention program throughout K-C mills. At the time—1919—he was with the U.S. Bureau of Mines as a safety expert. Joining the staff at K-C, Mr. Hoyman opened his safety campaign by making foremen and superintendents responsible for accident-prevention as well as for production.

Mr. Hoyman's work in accident-prevention was known throughout the country. He was the initial first aid instructor for the Red Cross in Wisconsin's Fox River Valley and taught first aid for many years at the Appleton Vocational School. He was at one time on the state committee on road and accident safety.

Pulp, Paper Section Plans Program for 1952 NSC Congress

One of the outstanding programs in the history of the Pulp and Paper Section has been planned for the 40th annual National Safety Congress, to be held in Chicago October 20-24. General chairman of the section is H. B. Goodrich, maintenance and safety engineer for Strathmore Paper Co., West Springfield, Mass.

As previously announced, all meetings of the section will be held at the Sheraton Hotel, instead of at the Stevens (now the Conrad Hilton) as last year. However, the general headquarters of the Congress will remain at the Conrad Hilton.

In addition to Mr. Goodrich, officers of the section are: A. E. Minor, Ontario-Minnesota Pulp & Paper Co., Kenora, Ont., vice chairman and program chairman; Arthur Carle, Northwest Paper Co., Cloquet, Minn., news letter editor; Dallas E. Henry, Southern Advance Bag & Paper Co., Hodge, La., secretary and membership chairman. Dan Adair is the NSC staff representative.

Pulp and Paper Section Program

Monday, October 20 (2 p.m.)

Progress Report, General Chairman H. B. Goodrich.
Report of the nominating committee: J. Fred Berry, personnel manager, Alton Box Board Co., Alton, Ill.
Election of 1952-53 officers.
Award of the Edward Benton Fritz Trophy (to be announced).
"Management and Safety," address by G. W. E. Nicholson, vice president in charge of manufacture for Union Bag & Paper Corp., New York, N.Y.
Social hour.

Tuesday, October 21 (2 p.m.)

A. E. Minor presiding.
"The Workmen's Compensation Board and You," address by D. D. McRae, assistant secretary-treasurer, Ontario-Minnesota Pulp & Paper Co. Ltd., Fort Frances, Ont.
Discussion.
Address (speaker to be announced).
Discussion.
"Unusual Accidents," address by R. W. Gray, safety director, Union Bag & Paper Corp., Savannah, Ga.
Discussion.

Wednesday, October 22 (2 p.m.)

Round Table Discussions.

1. Sulphite Pulp Manufacturing. Presiding, Ora Hazen, safety supervisor, Minnesota & Ontario Paper Co., International Falls, Minn.; conference recorder, R. W. Croucher, safety officer, Minnesota & Ontario Paper Co., International Falls, Minn.
2. Sulphate Pulp Manufacturing. Presiding, D. V. Hill, safety director, The Mead Corp., Kingsport, Tenn.; conference recorder, Fred O. Soughton, services and safety supervisor, LongLac Pulp & Paper Co. Ltd., Terrace Bay, Ont.
3. Paper Converting. Presiding, A. O. Vranek, safety director, Container Corp. of America, Chicago; conference recorder, R. G. Belknap, personnel manager, Bemis Bros. Bag Co., East Pepperell, Mass.

Thursday, October 23 (12:30 p.m.)

Luncheon. C. L. R. Dougherty, assistant manager, industrial relations, Union Bag & Paper Corp., Savannah, Ga., presiding; (speaker to be announced).

Thursday, October 23 (2 p.m.)

Round Table Discussions.

1. Paper Manufacturing. Presiding,

Francis H. Wagner, director of safety, The Mead Corp., Chillicothe, Ohio; conference recorder, C. R. Johnson, personnel director, Cornell Paperboard Products Co., Chicago.

2. Pulpwood Logging. Presiding, H. H. Jefferson, training officer, American Pulpwood Association, New York, N.Y.; conference recorder, Seth Jackson, safety officer, U.S. Forest Service, Washington, D.C.
3. Insulation Products. Presiding, H. M. Jackson, safety engineer, The Johns-Manville Corp., New York, N.Y.; conference recorder, B. J. Lee, safety director, Wood Conversion Co., Cloquet, Minn.

Safety Contest at Half-Way Point: Rate Below 1951

Compared with the identical period last year, the six-month frequency rate in the 1952 Paper Industry Safety Contest is down 3 per cent. The rate is 6 per cent lower than the 1951 final. This in spite of the fact that the monthly rate for June increased 12 per cent. According to a report of the National Safety Council, more than 100 contestants have maintained perfect scores.

The June frequency rate for all divisions was 9.18, while that for the first six months was 9.27. In the pulp and paper division the rate for the first six months was 9.16, down 1 per cent from last year. In the paper converting division the rate for the period is 9.31, down 8 per cent from 1951. Firms with perfect scores through June are as follows:

Division I—Pulp and Paper Mills

Group A
None

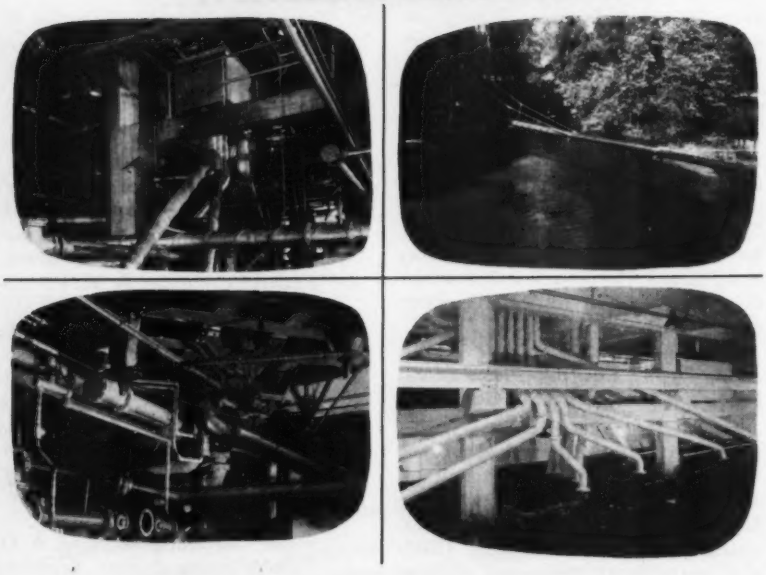
Group B
Price Bros. & Co. Ltd., Riverbend, P.Q., Canada
Fraser Paper Ltd., Madawaska, Maine
Fraser Companies Ltd., Edmundston, N.B.
Combined Locks Paper Co., Combined Locks, Wis.
West Virginia Pulp & Paper Co., Tyrone, Pa.
Gaspesia Sulphite Co. Ltd., Chandler, P.Q., Canada
Mead Corp., Michigan Division, Escanaba
National Gypsum Co., Newburgh, N.Y.

Group C
Mead Corp., Heald Division, Lynchburg, Va.
Fitchburg Paper Co., Fitchburg, Mass.
Marathon Corp., Menominee, Mich.
International Paper Co., Southern Kraft Division, Mobile, Ala.
Strathmore Paper Co., W. Springfield, Mass.
Abitibi Power & Paper Co. Ltd., Fort William, Ont., Canada
Congoleum-Nairn Inc., Cedarhurst, Md.
Abitibi Power & Paper Co. Ltd., Sturgeon Falls, Ont., Canada
Riegel Paper Corp., Warren Glen, N.J.

Group D
Masonite Co. of Canada, Ltd., Gatineau, P.Q., Canada
Certain-Teed Products Corp., York, Pa.
Strathmore Paper Co., No. 2 Mill, Woronoco, Mass.
U.S. Gypsum Co., Oakmont, Pa.
Container Corp. of America, Los Angeles
Central Fibre Products Co., Tama, Iowa
Marathon Corp., Ashland, Wis.
Strathmore Paper Co., Mill No. 1, Woronoco, Mass.
U.S. Gypsum Co., N. Kansas City, Mo.
National Gypsum Co., Garwood, N.J.
Lloyd A. Fry Roofing Co., Houston, Texas
Lloyd A. Fry Roofing Co., Memphis, Tenn.
Lloyd A. Fry Roofing Co., Summit, Ill.
Container Corp. of America, Chattanooga, Tenn.
Lloyd A. Fry Roofing Co., Jacksonville, Fla.
Lloyd A. Fry Roofing Co., N. Kansas City, Mo.
American Writing Paper Co., Nonotuck Division, Holyoke, Mass.
National Gypsum Co., Pryor, Okla.
Riegel Paper Corp, Hughesville, N.J.
Johns-Manville Corp., Asbestos, P.Q., Canada
Flintkote Co., Mt. Carmel, Ill.
Fort Wayne Corrugated Paper Co., Vincennes, Ind.
Kimberly-Clark Corp., Kapuskasing, Ont., Canada
Dexter Sulphite Pulp & Paper Co., Dexter, N.Y.
Container Corp. of America, Wilmington, Del.
Quaker Oats Co., Pekin, Ill.
Volney Felt Mills Inc., Fulton, N.Y.

CONSTRUCTIVE SUGGESTIONS

Typical Ways in Which NAYLOR Light-weight PIPE Serves Paper Mills



Stock and pulp lines ★ White water lines
Hot and cold water lines. ★ Condensate lines
Exhaust steam lines ★ Compressed air lines
Ventilating pipe ★ Pneumatic conveying lines

Write for Naylor Bulletin No. 507

NAYLOR PIPE

Naylor Pipe Company
1236 E. 92nd St., Chicago 19, Ill.
New York Office: 350 Madison Ave., New York 17, N.Y.

Compare the chips! Compare the costs!

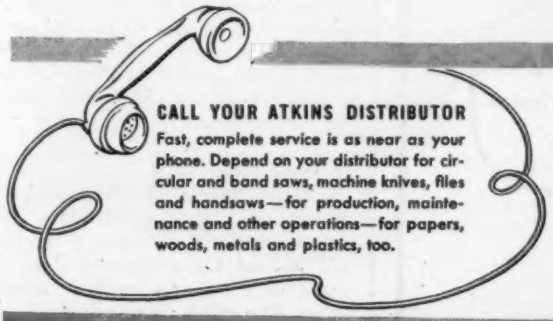
save two ways with Silver Steel®

You get better-quality, higher-income pulp with Atkins *Silver Steel* chipper knives —because the chips are always uniform, clean-cut, waste-free, and never bruised.

You save by cutting costs, too—because *Silver Steel* knives deliver longer runs between sharpenings, grind faster and easier. What's more, re-chipping is minimized—most times eliminated entirely. *Silver Steel* knives are finest steel, uniformly hardened and tempered, accurately finish-ground to size. They come to you in perfectly balanced sets—in solid or laid carbon steel, laid special alloy steel, solid high-carbon high chrome steel—for any machine, for whatever type fastening you request.

Consult your Atkins distributor now. Let him make the *Silver Steel* recommendations that save time and money on every cut. Standardize on Atkins—your one dependable source for paper cutting tools.

AAA ATKINS ALWAYS AHEAD



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Fast, complete service is as near as your phone. Depend on your distributor for circular and band saws, machine knives, files and handsaws—for production, maintenance and other operations—for papers, woods, metals and plastics, too.

ATKINS

E. C. ATKINS AND COMPANY • INDIANAPOLIS 9, INDIANA

International Paper Co., Livermore Falls, Maine
Riegel Paper Corp., Riegelsville, N.J.
International Paper Co., Riley, Maine
Johns-Manville Corp., Tilton, N.H.
American Writing Paper Corp., Mt. Tom Division, Holyoke, Mass.
Amalgamated Roofing Co., Chicago
Spaulding Fibre Co., N. Rochester, N.H.
Volney Felt Mills Inc., Mishawaka, Ind.

Division II—Paper Converting

Paper Bags

St. Regis Paper Co., Seattle, Wash.
St. Regis Paper Co., Los Angeles
Pillsbury Mills Inc., Wellsburg, W.Va.
St. Regis Paper Co. Ltd., St. Regis, B.C., Canada
Thilmany Pulp & Paper Co., Kaukauna, Wis.
St. Regis Paper Co., Playa Ponce, Puerto Rico

Boxes and Cartons

Group A

Container Corp. of America, Medford, Mass.
Container Corp. of America, Folding Division, Philadelphia (Manayunk), Pa.
Fibreboard Products Inc., South Gate, Cal.

Group B

Hankins Container Co., Cleveland
Fort Wayne Corrugated Paper Co., Chicago
Union Bag & Paper Corp., Savannah, Ga.
Hankins Container Co., Union, N.J.
Container Corp. of America, Knoxville, Tenn.
Gaylord Container Corp., Atlanta, Ga.
Gaylord Container Corp., Dallas, Texas
Gaylord Container Corp., Carton Plant
Container Corp. of America, Greensboro, N.C.
Robertson Paper Box Co. Inc., Paper Box Plant, Montville, Conn.
Container Corp. of America, Baltimore, Md.
Green Bay Box Co., Corrugated Division, Green Bay, Wis.
Southwest Corrugated Box Co., Sand Springs, Okla.
Container Corp. of America, Lake Shore Division, Chicago
Hankins Container Co., Chicago
Ohio Boxboard Co., Corrugated Container Division, Rittman, Ohio
Container Corp. of America, Philadelphia (Sixth St.), Pa.
Hankins Container Co., Elmira, N.Y.
Container Corp. of America, Muskogee, Okla.

Roofing Paper

Ruberoid Co., Joliet, Ill.
Flintkote Co., Chicago Heights, Ill.
Certain-Teed Products Corp., Dallas, Texas
Johns-Manville Corp., Marrero, La.
Lloyd A. Fry Roofing Co., Stroud, Okla.
Lloyd A. Fry Roofing Co., Detroit
Lloyd A. Fry Roofing Co., S. Kearny, N.J.
Lloyd A. Fry Roofing Co., York, Pa.
Lloyd A. Fry Roofing Co., Waltham, Mass.
Lloyd A. Fry Roofing Co., Robertson, Mo.

Insulation and Building Board

Abitibi Power & Paper Co. Ltd., Sturgeon Falls, Ont., Canada

Specialties

Lily-Tulip Cup Corp., Augusta, Ga.
Canadian Cellucotton, Niagara Falls, Ont., Canada
Old Colony Envelope Co., Westfield, Mass.
Marinette Paper Co., S. Glens Falls, N.Y.
Lily-Tulip Cup Corp., Springfield, Mo.
Kimberly-Clark Corp., Appleton, Wis.
Scott Paper Co. (Cut-Rite), Sandusky, Ohio
Lily-Tulip Cup Corp., Galva, Ill.
Lily-Tulip Cup Corp., French Lick, Ind.
Lily-Tulip Cup Corp., Brooklyn, N.Y.

Need
Paper Making Chemicals ?
See Solvay First !

QUESTION:
Who offers an *exclusive* type of Technical Service for the paper industry?

ANSWER:
SOLVAY offers a specialized paper makers' Technical Service manned by skilled technicians who are *experts in the paper field.*

QUESTION:
Who has a group of strategically located manufacturing plants, plus a coast-to-coast chain of warehouses and stock points in paper-making areas?

ANSWER:
SOLVAY!

QUESTION:
Which alkali manufacturer has served the paper-making industry over the longest period of time . . . and has accumulated more experience in the production of these vital paper-making chemicals?

ANSWER:
SOLVAY of course!

SOLVAY
REG. U. S. PAT. OFF.

SODA ASH
CAUSTIC SODA
LIQUID CHLORINE

SOLVAY Alkalies Chemicals Since 1881

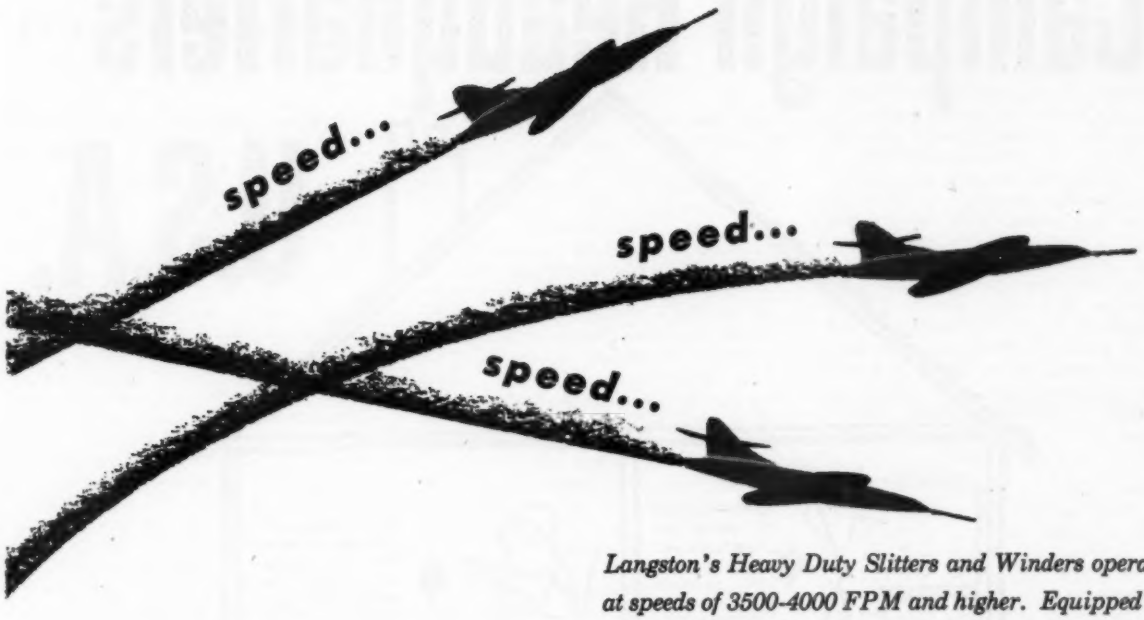
SOLVAY PROCESS DIVISION
ALLIED CHEMICAL & DYE CORPORATION
61 Broadway, New York 6, N. Y.

Safety Notes

Kimberly-Clark Corp.'s
Iron Mountain, Mich., plant was host to 215 employees of the paper mill department recently in recognition of a year's run without a lost-time accident. Guest speaker was Edward Page of Neenah, Wis., safety director, whose subject was "Off-the-Job Safety."

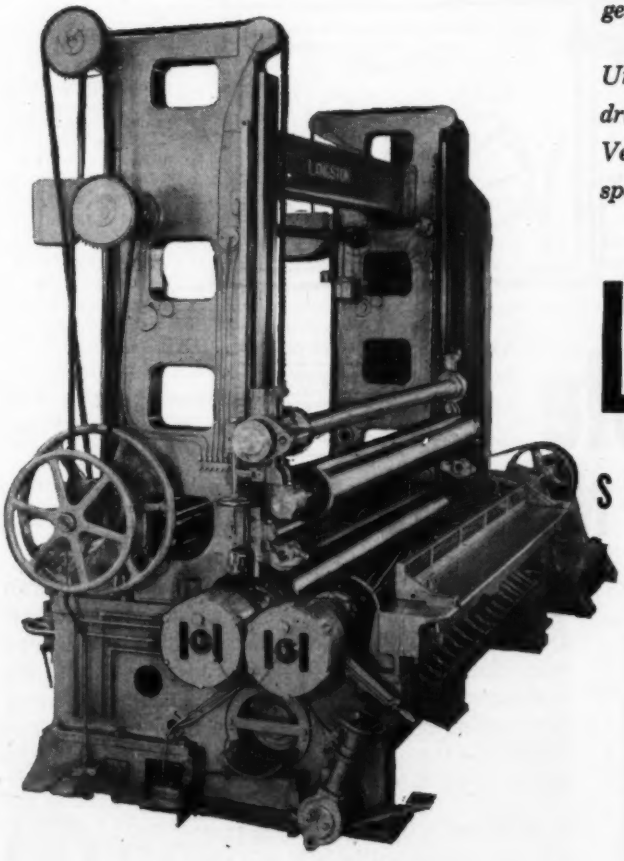
E. A. Page
of Kimberly-Clark Corp. has been appointed the Great Lakes Regional Membership Representative of the Pulp and Paper Section, National Safety Council. He is a past general chairman of the section and succeeds E. V. "Al" Johnson, also of Kimberly-Clark.

St. Regis Paper Co.'s
Kalamazoo, Mich., mill has passed the million man-hour mark without a lost-time accident. As of August 1, the mill had worked 158 consecutive days, or 1,009,116 man-hours, without serious injury. The mill is the first St. Regis operation to achieve the distinction.



Langston's Heavy Duty Slitters and Winders operate at speeds of 3500-4000 FPM and higher. Equipped with "V" belt drives for winding drums, driven slitter shaft and the top pressure or riding roll, all main gears are eliminated.

Under high speed operating conditions the gearless drive has proved to be extremely smooth and flexible. Very much quieter than gear drives, even at top speeds, its maintenance will be greatly reduced.



LANGSTON

SLITTERS AND WINDERS

SAMUEL M. LANGSTON COMPANY
CAMDEN, N. J.

Campaign Headquarters U.S.A.

Junior is putting on his GI uniform for the veterans' parade to remind everyone to register so they can vote Nov. 4.
Sis is boning up to write her entry in the Citizenship Essay Contest the businessmen's association is sponsoring at school.
Dad's easy chair is empty —he's at the meeting of the citizens' get-out-the-vote committee.
Mother's helping her club make a telephone campaign telling everyone when and where to register.
Grandma's sending registration reminders to all the church members. Even little Sis is helping—rubber-stamping messages on the cards.

The Family Vote will elect the Next President

NOT THE FARM VOTE...
THE BIG-CITY VOTE...
THE LABOR VOTE...
OR ANY PARTY VOTE...

Politicians talk a lot about this and that "bloc" of voters being decisive factors in this election. So do all the pollsters. You can't blame them for trying to dope it out that way in advance . . . but . . .

YOU know you're going to vote your own sweet way when you get behind that voting booth curtain—that where you live or work hasn't got a blankety-bloc thing to do with how you'll vote. You'll vote for what you believe to be in the best interests of your family—your kids—and your kids' kids.

So YOU know that this year—as always—it will be the FAMILY vote that really decides things. And families are working as never before to make sure every American votes. Right now in millions of American families, everyone from Little Sis to Grandma is pitching in to remind every eligible American to register to make sure of the opportunity to vote. And then they'll tackle the job of getting out the vote of every member of America's 44,000,000 families. They're the biggest "bloc" in America—they ARE America!

If your family is already working at the job—congratulations! If you aren't, talk it over at supper tonight, and pitch in tomorrow.

Foreign Abstracts . . . . . .

Determining the alkali-solubility of pulps

This first paper gives a very rapid method for determining the alkali soluble portion of a pulp. The air-dried sample is protected from mechanical damage. Hard sheets should be loosened (preferably by hand) and unbleached pulp should be freed from lignin by treatment with chlorine dioxide. Pulps retaining extractives in large amounts should be extracted prior to analyses. The sample (2.0 g. calculated on the oven-dry basis) is shaken with 100 ml. of the caustic soda solution (using any desired concentration). Shaking is carried out at least one hour at 20 C. Directly after the addition of alkali, the pulp is defibered by very vigorous shaking. The final agitation is done slowly in a suitable shaking machine. The pulp suspension is filtered through a suitable *dry* sintered glass filter (17G2 or a similar filter) and the filtrate is *refiltered once*. If possible, suction is avoided. In any event, air should not be sucked through the filter cake. Aliquots of the clear filtrate are removed by pipet, for oxidation and for the precipitation of the beta-fraction.

For the division into the beta and gamma fractions, a 25 ml. aliquot is usually used. The alkaline aliquot is diluted and treated with 2-Molar H_3PO_4 to pH 6. The final volume of this aliquot is then brought to exactly 100 ml. After standing overnight, the precipitate ("beta-cellulose") is separated by centrifuging, and 50 cc. of the clear supernatant liquor is taken for oxidation, which is best carried out in a 200 ml. (250 ml.) calibrated flask (pyrex). 0.1 *N* $K_2Cr_2O_7$ is added using at least a 30 per cent excess. The solution is diluted to 60 ml. with distilled water, and concentrated sulphuric acid is added to neutralize the alkali with cooling. Thereafter, another 100 ml. of concentrated acid is added with vigorous shaking. No external heat is required, and the mixture causes oxidation of the carbohydrate in the solution. After 10-15 minutes, the mixture is cooled and the volume adjusted to 200 or 250 ml. at 20 C. Beta plus gamma-cellulose *and* gamma-cellulose are then determined by measuring the absorbancy (A) at 600 μ and at 610 μ respectively, using a Beckman model DU spectrophotometer, making a suitable correction (for dichromate ions) and calculating the amounts of carbohydrate as anhydroglucose from a suitable calibration curve (which is not given in the article, but which is arrived at by oxidizing varying known amounts of glucose or xylose).

The author discusses the following: equations for the oxidation, the most effective wave length for the colorimetric measurement for Cr^{+++} ions, the accuracy and precision of the method, its application to linters, the effects of time, treatment, temperature, sampling, presence of other organic substances, etc. Karl-Erik Ohlsson. *Svensk Papperstidn.*, **55,** 347-57 (1952). (In English; 33 references.)

Pulping flax stalks with water

Flax stalks (fiber *I* or chaff *II*), both retted and unretted, were subjected to steam treatment at atmospheric pressure. The issuing steam was then condensed, combined with any aqueous extracts, and their components examined chemically. The fibrous residues were also studied. Losses were noted (as well as total, evaporated extractives) and compared with the over-all losses due to retting. In general, the per cent loss by steam treatment was roughly the same (i.e., about 25 per cent) as that obtained by *"double retting."* Single retting, however, gave much lower losses.

The steam extractives often showed remarkably high reducing values (especially when hypoiodite titrations were used), and similarly high values were obtained when spruce and beechwood shavings were steamed. The reducing values of the original *I* and *II* after retting or steaming were relatively low. The high hypoiodite reducing values are ascribed to the presence of sugars or derivatives obtained largely from hemicelluloses. Whereas the original uronic acid content varied from 3-6 per cent, steam extraction lowered this to 1-2.4 per cent (in the fibrous residues).

Furfural-yielding materials in the "steam extracts" were relatively high, and the fibrous residues after steaming in the case of *II* were lower than were those in the untreated *II*. This was not the case for *I*. The steam distillates from both retted and unretted *II* gave far higher acetic acid values than did those from *I*. The steam treatment, while not *qualitatively* comparable to double retting, yields a fiber which should not give trouble in subsequent spinning. Max *Lüdtke. Melliand Textilber.*, **33,** 107 (Feb., 1952). (In German.)

Pulp refining

The influence of hemicelluloses and lignin on the speed of hydration in the Lampén mill was studied. A kraft pulp ("Kemicon") containing 86.7 per cent alpha-cellulose, 8.3 per cent pentosans and 4.2 per cent lignin was delignified with chlorite by the method of Cundy and Beck and then contained 84.6 per cent alpha-cellulose, 8.4 per cent pentosans and 0.1 per cent lignin. In either case, the pulp (both before and after bleaching) was beaten in a Lampén mill (75,000 revolutions). The unbleached pulp showed a freeness of 90 deg. Schopper-Riegler (S-R) and the delignified pulp 85 deg. S-R. In other words, lignin removal had little effect on the pattern of hydration of the pulp.

When, however, the major part of the hemicelluloses was removed with NaOH (giving a pulp containing 94.5 per cent alpha-cellulose, 0.5 per cent pentosans and 0.1 per cent lignin) the beating curve flattened out and, after 50,000 revolutions in the Lampén mill, the deg. S-R was 40. A similar curve was obtained with pure cotton cellulose.

The specific surface of various pulps was also measured using the Clark technique [*Paper Trade J.*, **115,** No. 1, 32-9 (July, 1942)]. Thus, a bleached Fors-Haga pulp (15 deg. S-R) showed an initial surface area of 7,170 sq. cm./g. When refined to 89 deg. S-R, this increased to 17,780 sq. cm./g. Another bleached pulp showed (qualitatively) a similar increase in surface

The paper-technological institute at Munich

The business manager of the Section on Paper technology of the Oskar- v. Miller Polytechnikum at Munich gives a brief report on this relatively new development in 1950. Special stress is laid on equipment and its installation. For example, Fig. 1 shows equipment for experimental production of paper, and Fig. 2, the area devoted to paper conversion. Rudolf Popp. *Allg. Papier-Rundschau*, No. 5, 205-7 (1951). (In German.)

Fig. 1

Fig. 2

on beating. Cotton linters increased on surface slowly from 1620 at 10 deg. S-R to 7630 at 89 deg. S-R. Unbleached Kemicon pulp refined briefly showed an increase from 28 deg. S-R to 86 deg. S-R and an increased surface area from the initial 6800 to one of 15,900. This same pulp when delignified showed an increase from the initial 4130 to 12,600.

On the other hand, when delignified and freed largely from hemicelluloses, this same pulp (after 60,000 revolutions of the Lampén mill) showed a freeness of 42 deg. S-R and an increase from the initial surface of 4500 to one of only 7180 sq. cm. per gram. J. Escard and Andrée Saulquin. *Mem. services chim. etat,* **35,** No. 4, 17-24 (1950). [Through *C.A.,* **46,** 5315 (1952).] (Original in French.)

Chemical studies and the improvement of paper properties

Straw pulp (25 deg. Schopper-Riegler) was treated with increasing amounts of papermaker's alum (I) or aluminum chloride (II) in distilled water. Melamine resin (III) (3 per cent) was then added and handsheets prepared, which after conditioning 48 hours at 20 deg. and 65 per cent R. H. were subjected to the Elmendorf tear test (IV) and breaking length (V) determinations.

Wet IV and V were also determined both after conditioning (as above) and after drying 24 hours at 100 deg. Controls were run with sheets from untreated pulp and from pulp treated with III alone. When III alone was added, both IV and V increased well over those of the controls. Sheets which had been dried at 100 deg. and *then* moistened showed markedly greater IV and V than did those which had been moistened without oven drying. In some instances, IV of the wet sheet was practically identical with that of the air conditioned dry sheet, although V of the wet sheet was invariably much lower than that of the corresponding dry sheet. The effect of I and II (plus III) was negligible on the V of the wet or dry sheets but, in a few instances, improved the IV of both the dry and wet sheets. Using a bleached sulphite pulp, aluminum salts in general gave lower wet and dry V (than did III alone) and had no very marked effect on the IV.

A study was also made of the effects on IV, V and ash retention (VI) of a bleached sulphite pulp (58 deg. Schopper-Riegler) by using tap water (VII), water softened by a single permutite treatment (VIII) (*i.e.,* replacing calcium and magnesium ions by sodium ions) and water (IX) retaining only 20 mg. ash/liter, in conjunction with I and II (in varying concentrations). VII and VIII had very similar effects: wet IV increased slightly with aluminum ion increases (especially with II), but the dry IV decreased. Somewhat similar fluctuations were noted for V. In all cases, VI increased sharply with increasing I or II concentrations. When, however, IX was used in the pulp suspension, the changes in IV and V were negligible and VI increased only gradually (with increasing I or II concentrations). On moistening test sheets with VII, little change was noted in water retention or in V after 15 minutes (and up to 15 hours).

Pulp treated with 20 per cent I retained considerably less water than did untreated pulp and showed a markedly higher V. (Again, effects of steeping over long periods were not very marked.) Pulp treated with 10 per cent I showed the lowest water retention and the highest V. The data point to the sizing effects on the test sheet of aluminum salts alone. 13 references. M. Chêne and O. Martin-Borret (Univ. Grenoble, France). *Ann. inst. polytech., Grenoble,* 7-21 (1952). (In French.)

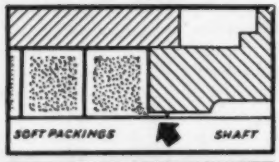
Determination of groundwood pulp in paper and board

Two general methods for this determination of mechanical pulp in paper products have usually been proposed: (1) the Halse procedure for lignin, and (2) the microscopical method of fiber analysis. A third method also involves an analytical procedure for lignin suggested by Af Ekenstam (the so-called CCA procedure). Despite the fact that data indicate that in the case of *well-defined* and *well-known* raw materials the lignin analysis (especially the Af Ekenstam method) would produce the more accurate results, this is not true when paper or board of unknown origin is being tested.

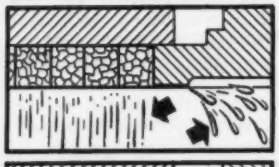
How easy it is to fall into errors (in the lignin analysis) is discussed by the author, and the conclusion is reached that, in general, the quantitative fiber analysis (2) is the most suitable one. The question as to whether it would be worth while to make a comprehensive investigation for establish-

Combination Sets

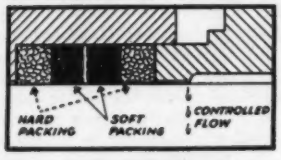
In the majority of cases, no one type of packing is 100% efficient. Therefore, "John Crane" recommends COMBINATION SETS to assure proper sealing. Here's why:



Straight soft packing used throughout permits end rings to squeeze into gland and throat clearances, thus sealing off the required amount of leakage needed to serve as lubricating film between shaft and packing.



Straight hard packing used throughout often is not sufficiently sensitive to gland pressure to control leakage within the desired limits. Also, the use of this single type of packing may result in scoring the shaft.



The right combination, however, of two types of "John Crane" packing offers better sealing, increased shaft life and less down-time in a variety of services. That's because soft inner rings are employed to provide a positive seal—yet allow Controlled Flow Lubrication, while harder end rings serve as a dam to stop inner ring extrusion.

...IN THE PAPER INDUSTRY

HERE'S THE RIGHT PACKING COMBINATION FOR HANDLING BLACK OR WASTE LIQUORS

End rings of "John Crane" braided asbestos packing Style 897 and intermediate rings of "John Crane" Super Seal #5 is the combination best suited to effectively handle black or waste liquors. Order a test set today and prove to yourself its advantages over your present packing.

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THE FOURTH DICALITE PLANT

will add approximately 80% increased production capacity for DICALITE calcined and processed filteraids and fillers

The new plant of the Dicalite Division, Great Lakes Carbon Corporation, at Lompoc, Calif., is now in volume production at a continually increasing rate. It represents over 5 years of engineering, design and construction, and is the largest complete unit for processing diatomite built in the last 22 years. Full designed output will add approximately 80% increased production capacity for Dicalite calcined and processed filteraids, fillers and other materials.

This increased production capacity insures a plentiful supply of Dicalite products for the future. Users can be confident of dependable delivery; with four plants in operation chances of interrupted supply are greatly reduced.

Advanced design of the new plant has afforded greater operating flexibility and extended processing ranges. Specifications for performance and quality of each product are readily maintained. Research data are being accumulated to aid in developing new and improved Dicalite products for future industrial use.

DICALITE DIVISION **GREAT LAKES CARBON CORPORATION**

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ing average lignin values and "confidence limits" for the components of various papers and boards, is answered in the negative by the author. R. Oskarrson (Central Laboratory of the Swedish Paper Industry). *Svensk Papperstidn.,* 55, 426-431 (1952). (In English.)

Attack on cellulose by means of sodium chlorite and of chlorine dioxide at various pH

Carefully purified cotton cellulose (12.5 g.) was treated with 1 liter 2 per cent sodium chlorite at varying pH (maintained by suitable buffers). Such suspensions were kept at 40 deg. for 24 hours, during which the degree of polymerization (D.P.) dropped gradually with decreased pH (the initial D.P. of 2420 falling to 1020 at pH 2). In another series, the suspension was kept at 70 deg. for 4 hours, and the D.P. dropped sharply to 540 at pH 2. In either case, the copper number and carboxyl content rose with decrease in pH, whereas the iodine number fluctuated. Oxidation-reduction potentials of sodium chlorite in the presence of cotton, determined at 70 deg. and 40 deg. and at varying pH, indicated that the potentials rose with decreasing pH and were slightly higher at the end of a treatment than the outset.

Chlorine dioxide (1 liter 0.5 per cent solution) acting 4 hours at 70 deg. on 12.5 g. cotton caused a very rapid drop in D.P. with decreasing pH, as well as a great loss in alpha-cellulose, a rise in copper number, rise in carboxyl content, and slight rise in iodine number. Here, the initial oxidation-reduction potential varied little between pH 6.5 and pH 1.4 but, at the *lower* pH (e.g., 1.4) it was markedly higher at the end of the reaction. (At pH 6.5, however, it was actually lower than it had been initially.)

When cotton (15 g.) was treated 2.5 hours at 70 deg. with 1 liter 1 per cent sodium chlorite at pH 5, the D.P. and alpha-cellulose content dropped negligibly and the copper number remained unchanged. (At 90 deg. the D.P. was markedly lowered.) Kraft of sulphite pulps were less affected by sodium chlorite at pH above 5 than was cotton.

The difficulties in determining chlorine dioxide and the chlorite ion are discussed briefly. R. P. Lapeze and S. Dardelet (University of Grenoble, France). *Ann. inst. polytech., Grenoble,* 23-35 (1952). (In French.)

JAMES MONROE
Fifth President of the United States, 1817-1825
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Inaugural Address, March 5, 1817

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WOOLEN MANUFACTURERS SINCE 1856

the DRAPER Belt

The determination of lignin in plant tissues and in pulps

Using various wood, straw and pulp samples, the authors determined lignin (I) by the following procedures: the U.S. Forest Products Laboratory method, the Af Ekemstam method, a (fully described) modification of the Af Ekemstam technique, the Noll procedure, and the colorimetric technique of Mehta. In each case, the precautions required and attendant difficulties are fully discussed. Determination of the methoxyl in I is also outlined.

In general, the methods for I gave reasonably concordant results, although in the case of woods and straw, the Forest Products Laboratory method proved the most useful. I determinations on unbleached sulphite pulps invariably led to filtration difficulties and, in the application of the sulphuric acid methods, some I was also lost in the acid filtrates.

All methods could be applied to kraft pulps. In the case of bleached pulps, only the colorimetric method of Mehta was applicable. M. Chêne, C. Diessenberg and N. Lion (Univ. Grenoble, France). *Ann. inst. polytech., Grenoble,* 111-125 (1952). (In French.)

Pulping difficulties with Karamatsu (larch) heartwood

The heartwood of larch, "Karamatsu" (*Larix leptolepsis,* Murray) gives difficulties in delignification by the sulphite process, and the pulps formed are yellow or green. These difficulties were ascribed to the presence of a flavanone in the wood, and on methanol extraction the author found a crystalline compound which appears to be identical with the *taxifolin* isolated from Douglas fir by Pew [*J. Am. Chem. Soc.,* **70,** 3031 (1948).]

When a coniferous wood (which is normally pulped easily) was impregnated with a sulphite liquor containing taxifolin, the resulting chips were pulped with difficulty and the resulting pulps were also yellow. The author discusses the reasons for these difficulties. Michihiro Fujii. *J. Japanese Tech. Assoc. Pulp and Paper Ind.,* **6,** No. 2, 119-21 (1952). (Original in Japanese, with a brief English summary on p. 181.)

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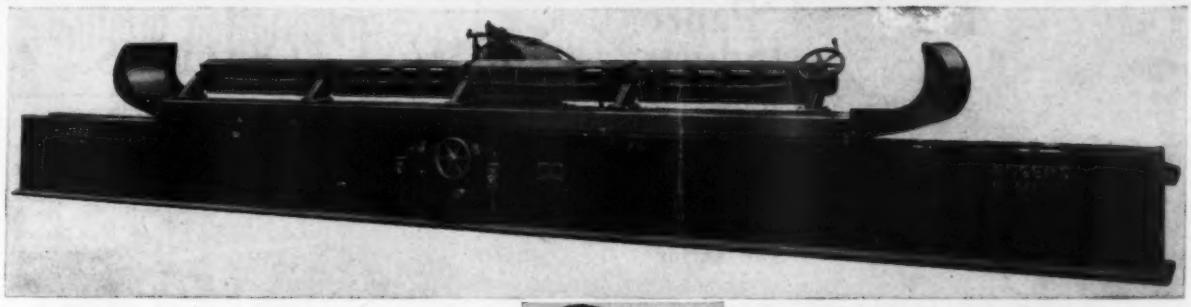

Series 220 . . . is a powerful, new design for high production and fast grinding of all heavy-duty straight knives. Model illustrated above handles knives up to 200" long. Its sturdy cabinet base is 30' long and its entire weight is more than 10 tons.

A unique development allows for grinding 2 up . . . a 90" stroke grinder therefore has the same capacity as 180" stroke machine. Variable, reversing motor drive allows for fast feeds . . . up to 100 fpm. Magnetic chucks are available to further speed grinding cycle.

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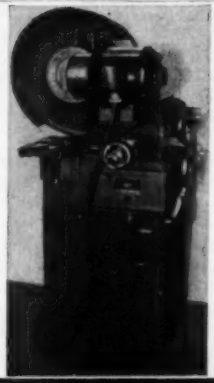

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The CC-3 is the only machine of its kind made to grind all types of circular knives and both top and bottom slitters with diameters of 2" to 20". Knife life can be increased by as much as 30% . . . and savings therefore made on fewer knife replacements. A magnetic chuck can be supplied to speed set-up time. Keep your knives and slitters in their original fine cutting condition . . . send for further information.

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14 ROLLS INSTALLED 14 YEARS AGO

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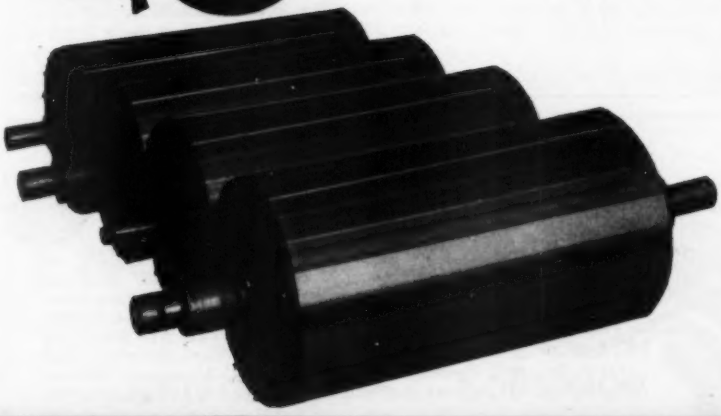

With new, corrosion-resistant Monel covers, the rolls are more efficient than before, for Monel guards against acid attack indefinitely . . . outlasts cast iron many times . . . saves the cost of new cores . . . eliminates frequent regrinding.

Both new and old rolls can be furnished with wear-resistant, corrosion-resistant Monel covers. Ask your paper machinery builder about them, or contact . . .

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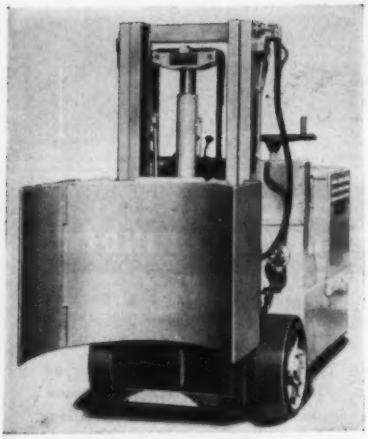


Paper roll clamp

A hydraulically actuated roll handling assembly for the Mercury line of fork trucks has recently been announced. The entire clamp assembly is compactly constructed in "unit" fashion so that it can be installed in place of standard forks. Pressure connections to the assembly are of quickly detachable self-sealing type, and electrical connections are plug and socket-type. Two bolts retain the assembly on the lifting carriage, and installment or removal and replacement can be effected in approximately 20 minutes or less.

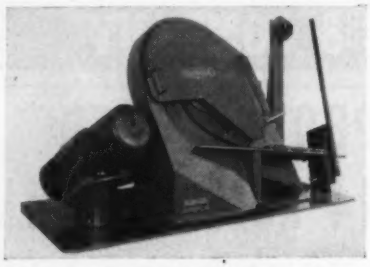
The clamp involves a "flipper" arrangement. Horizontally disposed rolls can be easily picked up without necessity of blocking and without employing the special forward tilt range usually incorporated in a roll handling chassis. It is also possible to "break out" rolls from tightly packed shipments by sliding them sideways by use of the "flipper" movement.

Continuous clamping action is maintained through the use of a specially designed hydraulic system which includes a locking valve in the clamping cylinder and a pressure switch in the pump motor circuit. *Mercury Mfg. Co., 4044 S. Halsted St., Chicago 9, Ill.*

Tail cutter

The Moody automatic tail cutter is a new and unique tail cutting device applicable to any papermaking machine and particularly adaptable to higher speed, wide web tail cutting operations for quick and economical reel starts.

This tail cutter is electrically operated, compactly designed and can be quickly installed at any point along the paper machine. The machine features a high-speed retractable cutting knife which automatically and transversely cuts the sheet for transfer from full to empty reel cores. It can also be installed at the calenders, the dryer section or at any other point where cutting is required. The tail cutter completely eliminates the hazard of manual web cutting. *Black-Clawson Co., Hamilton, Ohio.*



Power strap dispenser

For volume users of heavy-duty strap, a new mill-type power strap dispenser handles ribbon wound strap in ¾ in., 1¼ in. and 2 in. widths. The dispenser feeds strapping at a rate of 6 to 10 ft. per sec., and the cutting operation requires only 2 to 4 secs.

The machine is easy to operate with push-button control of strap feed. The dispenser cannot start until the safety door on the coil holder is shut. It has a Dodge speed reducer and Stearns magnetic disc brake. Cutter blades of high carbon, high chrome steel are reversible. *Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.*

Floor truck

Designed especially for handling double-faced pallets, a newly improved truck has been added to the Leverlift line of floor trucks.

The new truck features a forked design platform with "Toggle Boosters" and helper rolls that enable it to slip easily into double-faced pallets without jockeying. Toggle boosters on the ends of the platform tines engage the bottom face of the pallet first, lifting the platform slightly so that the rear wheels can roll smoothly into the pallet. Rear wheels of the truck are then projected through the bottom of the pallet and the load is lifted by action of the hydraulic pump. As the platform is raised, it moves toward the operator, facilitating use against walls.

Capacity of the truck is 4,000 lb., and it is available in five standard fork lengths. *Service Caster & Truck Corp., Albion, Mich.*

Inductance bridge receiver

A new receiver for measurement and control of flow and liquid level, the ElectroniK inductance bridge receiver, combines in a single instrument a number of functions

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The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in three sizes: "A" size, 8½" x 11½"; "B" size, 17x23"; and "C" size, 25x38". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the 1951 Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL
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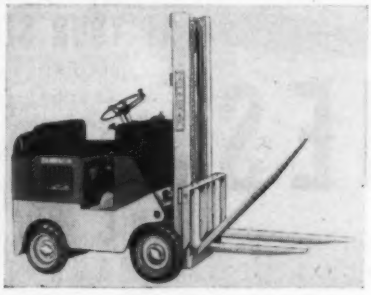
Chicago 11, Illinois

which formerly required the use of two instruments.

For example, the new instrument makes it possible to indicate, record, integrate and control flow and liquid level. Data can also be retransmitted pneumatically to a second receiver remotely located. An Indexet mechanism is available to reset the control index from a remotely located transmitter.

Claimed to be accurate to within plus or minus ½ of 1 per cent of full scale, the instrument combines the inductance bridge transmission system with the Brown "Continuous Balance System" for power positioning of the pen.

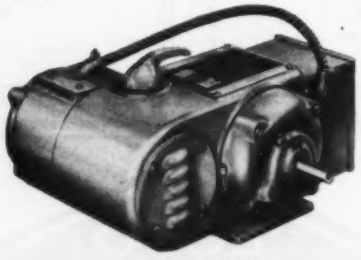
It is easily installed in replacement of older inductance bridge receivers and does not require any special provisions or extra equipment. The new receivers can be used with any of Brown Instruments' electric flow or motion transmitters. *Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.*



Fork extension

Designed for safe handling of such loads as steel sheets, skids and boxes of unusual length, Towmotor fork extensions are quickly and easily removed. This feature permits the lift truck to retain its standard maneuverability on handling assignments requiring standard length forks.

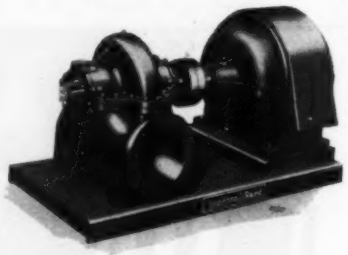
A locking feature of these fork extensions prevents movement forward or backward over the regular forks; side flanges hold them firmly in place laterally. *Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.*



Variable speed motor

A new development in single phase variable speed motors in fractional horsepower is the Type VA-C Varidrive motor. A modification of the Type VA Varidrive line, the new motor permits use of 110 or 220 volts and is made in ¼, ⅓, ½ and ¾ h.p. This compact, lightweight motor provides speeds in a 10:1 ratio with the range from 4 to 10,000 rpm.

By turning a control dial, the motor's speed can be instantly changed to a desired speed without stopping. It eliminates the necessity of an external speed changing device or gear box and occupies little more space than a standard fixed speed motor. *U. S. Electrical Motors Inc., Box 2058, Los Angeles 54, Calif.*



Double-suction pump

Advanced design improvements have been made in Ingersoll-Rand's existing line of small, single-stage, double-suction pumps. These pumps, known as the Class DMV-DHV, are the first to incorporate double mechanical shaft seals with sealed, prelubricated ball bearings. The result is a compact, totally enclosed pumping unit that requires minimum attention and maintenance and reduces floor space requirements.

Built in 3, 4, 5 and 6-inch sizes, the DMV (for medium heads) and the DHV (for high heads) are designed for general hydraulic services at temperatures up to 200 F., capacities to 2100 gpm and pressures to 150 psi.

Through standardization possible with this improved design, three spare parts kits serve all eight pumps in the DMV-DHV line. *Ingersoll-Rand Co., Dept. CAM, 11 Broadway, New York 4, N.Y.*

Surface Pyrometer

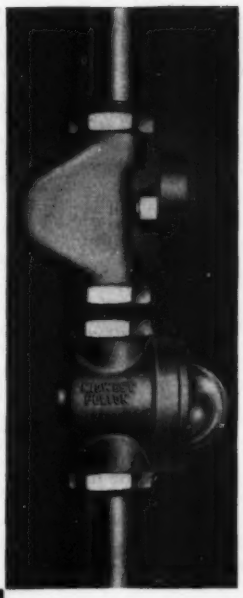
The new Pyro surface pyrometer for surface and subsurface temperature measurements is available with a selection of 14 different types of thermocouples and extension arms. It can be equipped with a new quick-change connector which permits the thermocouples to be snapped and locked onto the extension arms in a matter of a second, without any tightening needed. Thermocouples are interchangeable without adjustment or recalibration.

Another exclusive feature is the Pyro lock-swivel which permits locking thermocouples at any desired angle without danger of their jarring loose while the temperature measurement is being made.

This surface pyrometer is shock, dust and moisture-resistant, and the shielded steel meter housing is designed to withstand rough usage. It is available in five different temperature ranges. *Pyrometer Instrument Co., Inc., Bergenfield, N.J.*

A Sight-Flow Indicator
that Really Works

The Midwest Ball Sight-Flow is the one and only dryer condensate indicator with a "Window" that really stays clear—is constantly being scoured and kept clean by the violence of the liquid as it passes. The thousands already in use on both wet and dry end dryers prove that statement.



Flow visible from front and both sides. Installation in discharge line either vertical or horizontal.

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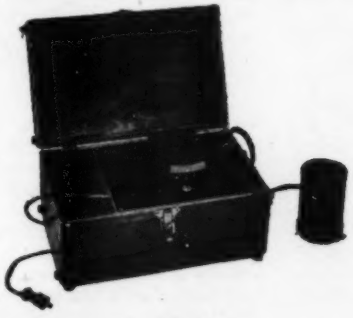

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PROPER INSTALLATION —A "Must" For Best Results

1. *Locate pump as close as possible to water supply* to keep suction line short and direct. Give your pump the best chance for peak performance.

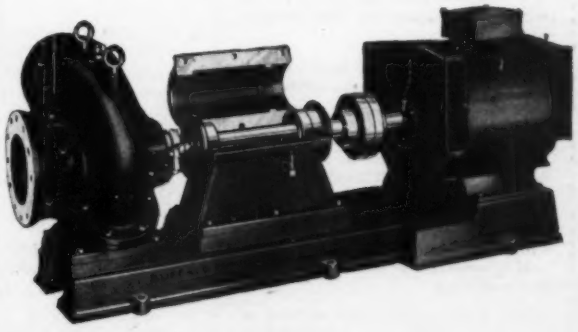
2. *Keep friction losses at a minimum* by keeping fittings to a minimum and suction pipe larger than the suction opening of the pump.

3. *Avoid air locking in suction line.* Be sure suction line has no "humps" or "hollows" where air pockets might form.

4. *Maintain shaft alignment.* Pump foundation should be sturdy enough to avoid sagging, which causes misalignment. When installing pump, check alignment with feeler gauge between impeller and clearance ring to be sure clearance is the same at all points. Poor alignment results in excessive coupling and bearing wear, and lowered efficiency.

Be Sure the Pump Is Right, Too —Specify "Buffalo"

Since the installation can be no better than the pump, it is important to pick one of known quality. "Buffalo" Pumps are giving satisfaction in every industry, handling every type of liquid from clear water to paper stocks. They are known for their high efficiency, their simple maintenance, their long life on the job. Specify "Buffalo" and be sure of the results you want. Below is one of many types of dependable "Buffalo" Pumps.



"Buffalo" Diagonally Split-Shell Paper Stock Pump with non-clogging enclosed impeller. Many of these pumps are handling stocks above 6% consistency satisfactorily. Both bearing cover and upper pump casing are easily removed for inspection and servicing. Available rubber-lined for corrosive or abrasive liquids. WRITE US ABOUT YOUR PROBLEM, REQUESTING BULLETIN 953-H.

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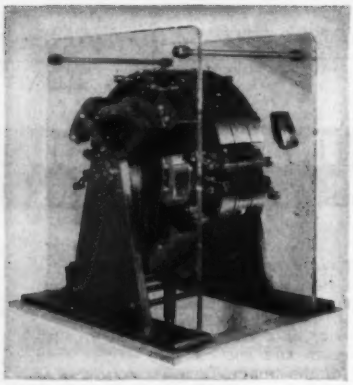
A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID



Bottom folding drum

The bottom folding drum and cam arrangement is a part of the Weber No. 5 S.O.S. Specialty bag machine, which has a capacity up to 300 bags per minute and produces a wide range of one and two-ply self-opening style and satchel bottom bags.

The bottom folding drum makes bag size changes quickly because the various parts and the fingers particularly are adjustable rather than requiring interchangeable parts.

Critical parts such as drum clamps, drum fingers, opening cylinder fingers, center gripper finger holders, as well as the complete cam system, are made from various grades of Ampco Metal castings. The cam followers operating on all the cams make the cam contact 300 to 500 times per minute with a roller pressure of 35-40 lb. *H. G. Weber & Co., Inc., Kiel, Wis.*

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New Products Briefs . . .

FAN—The power line exhaust and pressure fan, Type PLBD, is a heavy-duty belt driven fan for industrial applications, duct work, mine exhaust systems and filtering units where a large volume of air is required under static pressure. It is equipped with non-overloading cast aluminum airfoil-type propellers. These units are completely ball bearing and motors are totally enclosed. *Chelsea Fan & Blower Co., Inc., Plainfield, N.J.*

NEOPRENE SOLUTION—Neelium, a new high-solids liquid Neoprene solution which can be readily brushed and cured at ordinary temperatures to form a thick resilient protective film, is designed specifically as an industrial maintenance coating, producing high quality coating of maximum thickness with a minimum amount of labor. It has a solids content of greater than 60 per cent. *Atlas Mineral Products Co., 121 Norman St., Mertztown, Pa.*

FIRE EXTINGUISHER—The new corrosion-proof, rustproof Safety Spray automatic fire extinguisher, with fire-killing carbon tetrachloride sealed in a glass container, is encased in tough fire-resistant plastic. The few small metal parts are cadmium plated. It may also be operated manually. *Red Comet, Inc., Littleton, Colo.*

FOG NOZZLE—A new line of low-priced stainless steel fixed installation fog nozzles for industrial processing and fire protection, known as the AA series, are smaller in size and lighter in weight than previous models. These nozzles employ the patented spiral principle of atomization and incorporate many refinements in design over similar earlier models. They are easy to clean without removal from the installation. *Bete Fog Nozzle Inc., 85 Pierce St., Greenfield, Mass.*

PACKING—"Continuous-Vee" packing is a new, continuous chevron-type packing designed for 500-6000 psi, and is available in two styles for either high or low temperatures. It is furnished in sizes from ¼ in. to 1 in., by 1/16 in. increments, 25 ft. per spiral. *Flexrock Co., Mechanical Packing Div., 3670-B Cuthbert St., Philadelphia 4, Pa.*

VISCOSITY METER—The "Ultra-Viscoson" for continuous, automatic viscosity measurement using ultrasonics, has a hermetically sealed probe, the size of a fountain pen, has no moving parts, operates to 650 F., 10,000 atmospheres pressure, and is installed permanently in pipe lines, production kettles or used in test tubes and beakers. Connection to a recorder or controller provides continuous charts or automatic control. *Rich-Roth Laboratories, 673 Connecticut Blvd., East Hartford 8, Conn.*

DIAPHRAGM VALVE—The new "Quick-As-Wink" diaphragm operated spring return single plunger valve is for use when only low-pressure air is available for the pilot control. They can be operated with instrument air at pressures of from 12 to 35 psi on the diaphragm. It is claimed that the improved design prolongs the life of the packing and valve parts and that the valves can be completely disassembled and reassembled quickly without disturbing the main piping. *C. B. Hunt & Son, Inc., Salem, Ohio.*

FURAN COATING—A two-year old thermosetting furan coating, known as Carbo-Kote 6020, has been improved in physical characteristics and ease of application. It can be brushed or sprayed and requires no special safety precautions. This coating resists most non-oxidizing acids, practically all solvents and all alkalis, as well as corrosive mixtures, salts, etc. Bond to properly prepared surfaces is permanent even under high temperature variations. *Carboline Co., 7603 Forsyth Blvd., St. Louis 5, Mo.*

WATER-REPELLENT COATING — Hydrocide Colorless SX, a penetrating solution of organic silicones, makes all types of above-grade porous masonry water-repellent immediately after drying. It is invisible, will not discolor, will not wear away, sheds dirt, controls efflorescence, and is long lasting. *L. Sonneborn Sons, Inc., Building Products Div., Dept. P-2, 80-8th Ave., New York 11, N.Y.*

RESIN—A new, low-cost medium capacity cation exchange resin, Amberlite IR-112, having high regeneration efficiency and low leakage characteristics, is now available. It is said to possess all the desirable physical and chemical properties of the polystyrene nuclear sulphonic acid class of exchangers. The new resin is the most porous cation exchanger developed to date for commercial use. *Rohm & Haas Co., Resinous Products Div., Washington Square, Philadelphia 5, Pa.*

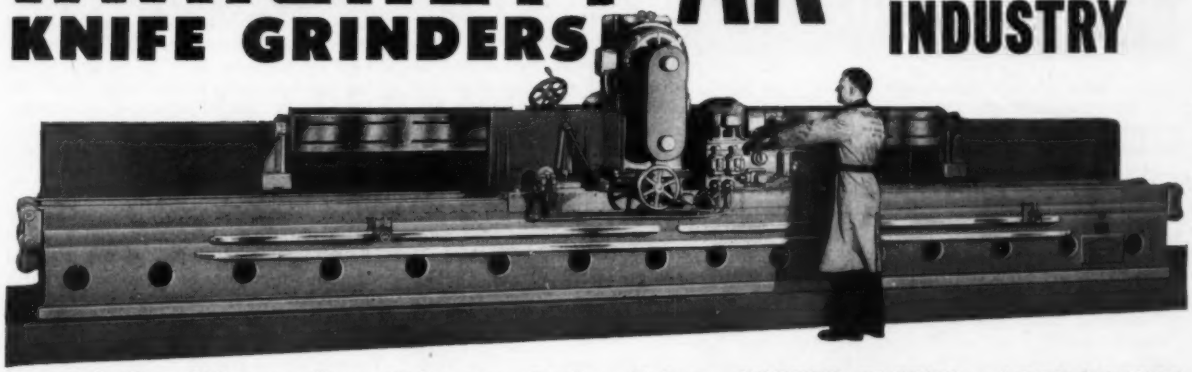
WATERPROOF TAPE—A newly developed tape, Polyken No. 329, has good tack adhesion, and tensile strength. Under rigid government testing, it is revealed to be an almost perfect moisture vapor barrier—for all practical purposes 100 per cent waterproof. *Polyken Industrial Tape Dept. of Bauer & Black, Div. of Kendall Co., 222 W. Adams St., Chicago 6, Ill.*

TACHOMETERS — Two new tachometers which have been added to the O-Z line are the Universal and Single Range tachometers. One feature common to both is the knife-edge hand which makes almost two complete turns for each range, resulting in a very long scale with wide open divisions which are easy to read at all points. These tachometers operate on a new patented centrifugal, double cross pendulum principle. Another improvement is the high-speed, light wind vane damping mechanism. *O. Zernickow Co., 15 Park Row, New York 7, N.Y.*

EMERGENCY SHOWER—This new emergency shower is a completely portable unit, mobility being achieved by rolling casters. The unit is held fixed in position by means of adjustable truck stops. A ramp is provided for easy access to the shower. New techniques in spraying water are used. *Logan Emergency Showers, Inc., P.O. Box 111, Glendale, Calif.*

ALARM UNITS—Tel-Alarm, new type of automatic alarm units for remote signalling of failure or other-than-normal operation

HANCHETT AK KNIFE GRINDERS FOR THE PULP & PAPER INDUSTRY



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of valves, pumps, heaters and many other kinds of equipment in process operations, are of "unitized" construction, permitting a great variety of circuit arrangements from one basic alarm unit. These hermetically sealed units are moisture- and corrosion-proof. *Tigerman-Anderson Co., 4332 N. Western Ave., Chicago, Ill.*

TOGGLE BOLT—A new type toggle bolt is now available which offers three advantages not previously obtainable. These 3-in-1 toggle bolts may be installed with either the head of the bolt outside the wall or with the nut outside the wall, and the toggles may be purchased separately and used with any bolt. *Super-Grip Anchor Bolt Co., Inc., 3333 N. 22nd St., Philadelphia 40, Pa.*

CHEMICAL-RESISTANT PLASTIC—A new plastic material called "Chemrok" is highly chemical-resistant and capable of withstanding heavy mechanical loads and high temperatures. Its point of sag is claimed to be 50 to 100 F. higher than chemically resistant hard rubbers. *Richardson Co., 2766 Lake St., Melrose Park, Ill.*

WATER-REPELLENT COATING—"Stonseal," a water-repellent liquid chemical, provides an invisible "raincoat" for brick, concrete, stucco and other masonry. It does not discolor or change the texture of the surface, leaves no film, is acid and alkali-resistant, unaffected by salt spray, and can be applied at any temperature. It also helps prevent efflorescence and the adhesion of soot or grime to building walls. *Stonhard Co., Dept. EW, 1306 Spring Garden St., Philadelphia 23, Pa.*

LEAD LUBRICANT—A new heavy-duty grease lubricant, known as Lead-Lube, has an extremely high metallic content in the form of a pulverized lead dust, kept in permanent suspension by a homogenizing process. The metallic lead in this lubricant forms self-lubricating surfaces over all the wearing parts of gears and bearings. It will re-surface pits and scores in older equipment. *Knapp Mills, Inc., 23-17 Bordon Ave., Long Island City 1, N.Y.*

CLEANING UNIT—A new jet cleaning unit, designated as the "Chemo Jet" cleaner, is able to throw a solid stream of hot chemical and provide a separate high impact jet of water. It handles all requirements of the two-step cleaning procedure needed to remove smokehouse deposits, paint, and similar stubborn matter. *Sellers Injector Corp., 1671 Hamilton St., Philadelphia 30, Pa.*

SLIME CONTROL—Pyridose is a 100 per cent water-soluble organic mercurial. No solubilizing agents or diluents are added. It contains 47.5 per cent mercury. *Mallinckrodt Chemical Works, 72 Gold St., New York 8, N.Y.*

PACKING BASE—Die-formed rings or washers manufactured from a new semi-metallic base which fills in any minor irregularities existing in machined stuffing boxes, bonnets, glands, stems, or rods offer lower machining costs through more lenient tolerances. *Abbott & Biddle Co., 2413-27 Federal St., Philadelphia 46, Pa.*

FACE SHIELD—The new "Halo" face shield is made of new materials which give greater lightness, comfort, longer wear and ease in cleaning, without sacrificing ruggedness and strength. It is streamlined and has a green anti-glare spark protector which allows wide angle vision and does not block the upper circle of vision. The visor has a patented position hinge which locks the visor in "raised" or "working position." *United States Safety Service Co., 1215 McGee St., Kansas City 6, Mo.*

PROTECTIVE CREAMS—A new line of antiseptic protective creams containing Hexachlorophene have recently been introduced. These new creams include: No. 211, an oil-resistant, water-soluble bland vanishing cream for protection against dust-borne irritants, viscous oils, dirts, greases and grimes; No. 311, a water-resistant soft cold cream for protection against dilute acids and alkalis; and No. 411, a solvent-resistant water-soluble bland vanishing cream for protection against organic solvents, acetates and cooling and cutting oils of low water content. *West Disinfecting Co., 42-16 West St., Long Island City 1, N.Y.*

INSECTICIDE—Vaposector, the highly concentrated liquid insecticide operates on the principle of "double penetration." By turning a valve, Vaposector is transformed into a fine mist which permeates every recess, permanently paralyzing the insects. There is no toxic peril when used according to directions. *West Disinfecting Co., 42-16 West St., Long Island City 1, N.Y.*

SWITCH—A snap-action switch designed for high-precision performance in rugged, cam actuated service, has the capacity to make or break steady state currents of 20 amps. and to handle inrush currents as high as 75 amps. This new design has a roller plunger actuator adapted to operation by cams with a rise of up to 30 deg. The plunger assembly can be turned to any position necessary to align its roller with the direction of cam approach. *Micro Switch, Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill.*

ROOF COOLERANT—A new roof coolerant, brushed or sprayed on by unskilled labor, immediately reduces below-roof temperatures by deflecting up to 75 per cent of the sun's radiant heat. It also helps retain the flexibility needed for expansion and contraction of sudden temperature changes, thus prolonging roof life. *Tropical Paint & Oil Co., Cleveland, Ohio.*

FLOOR HARDENER—Known as Concrete Floor Hardner No. 860, this clear, colorless liquid is reputed to change the chemical structure of concrete on which it is applied, forming a dense, non-porous, flint-like surface which retards dusting and rutting even under the heavest traffic. It is also claimed to increase the general strength of a concrete floor and retard cracking and chipping under heavy loads and to resist water, oil and acid. *Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio.*

INTERCOMMUNICATIONS SYSTEM — A new "job-fitted" intercommunications system with eleven optional features designed so that a single system may be adapted to any specific requirement from a simple inter-office system to the most elaborate industrial layout is now available. Some of the optional equipment offered includes: busy signal, dynasonic performance, multi-magic selector, privacy handset, silent touch, etc. *Talk-A-Phone Co., 1512 S. Pulaski, Chicago, Ill.*

REFLASH STEAM SEPARATOR—Available in different sizes and easily installed, this reflash steam separator recovers the excess heat from reflash steam and puts it to work in low-pressure heating or process lines. The separator can be used in high-pressure condensate and continuous blowdown systems. *Strong, Carlisle & Hammond Co., Cleveland 13, Ohio.*

OVERHEAD GUARD—This overhead guard, a standard fork lift accessory, provides protection for Towmotor fork lift truck operators in high-stacking multi-unit loads. Sturdily constructed of 1½-in. and 2-in. steel pipe, it is recommended for use on all lift trucks with a lift exceeding 144 in. *Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.*

POURING SPOUT AND TILTER—Provides a safe and easy method of pouring liquids into smaller containers without spilling or splashing. A chain is provided to hold the bottle in position when tilted. The cradle is made of steel. The safety air vent pouring spout fits any size bottle and assures a smooth even flow. *General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.*

POLYVINYL ALCOHOL—From the large number of possible combinations of viscosity and degree of hydrolysis, six standardized grades of polyvinyl alcohol have been selected for manufacture under the trade name "Lemol." The Lemols provide tough, water soluble resins. *American Monomer Corp., Leominster, Mass.*

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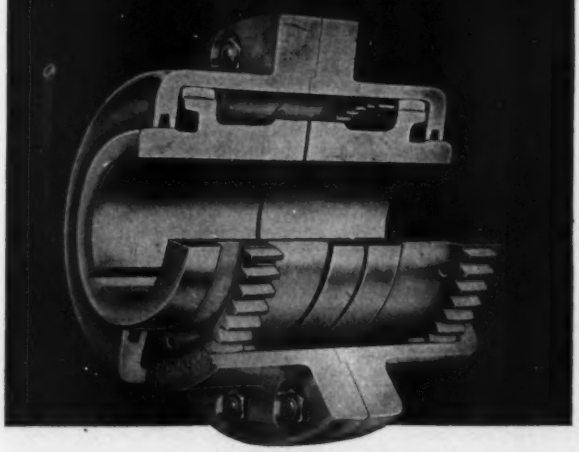

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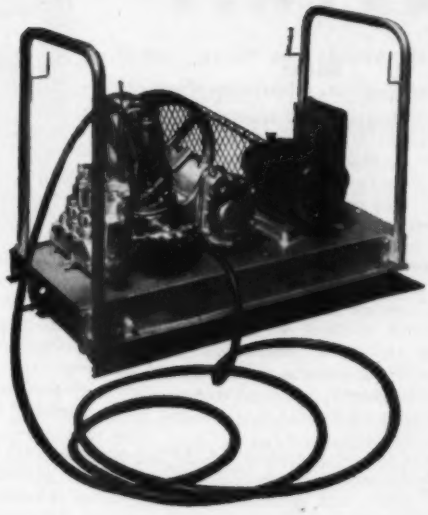

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The Paper Industry New Literature

Books

INDUSTRIAL AND COMMERCIAL ELECTRICAL REFERENCE. Second Edition. By E. S. Lincoln. Published by Electrical Modernization Bureau, Inc., 110 Mamaroneck Ave., White Plains, N. Y. 1760 pages.

Every section of this new edition has been revised in the light of modern developments, and many of them have been completely rewritten. The entire N.E.C. Code and appropriate NEMA Standards are included, in addition to 500 tables, 400 diagrams and 1400 illustrations. A new indexing system includes individual section indexes, a general, or cumulative index, and an index of the N.E.C. Code and the NEMA Standards.

Some of the topics covered include: electrical fundamentals, panelboards, electrical control, motors and generators, industrial electrical heating, electrical measuring instruments, electrical measurements, mechanical drives, etc.

SPECIALTY PAPERS—Their Properties and Applications. Edited by Robert H. Mosher. Published by Remsen Press, 212 Fifth Ave., New York 10, N. Y. 512 pages. $10.00.

A companion volume to "Technology of Coated and Processed Papers," this book contains information on the different products of the paper converting industry, the raw materials used in these products, the techniques used in their manufacture, and the tests used in their evaluation. The results of intensive research in synthetic resins, pigments and solvents used in converted paper products, as well as the new advancements in the processing equipment, are discussed in detail.

TECHNOLOGY OF COATED AND PROCESSED PAPERS. Edited by Robert H. Mosher. Published by Remsen Press, 212 Fifth Ave., New York 10, N. Y. 736 pages. $15.00.

This companion volume to "Specialty Papers" covers the more technical aspects of the subject, presenting a detailed picture of the modern raw materials, manufacturing processes and equipment, and formulations used in the various branches of the specialty-paper industry. Finished products and their evaluation are also discussed.

The editor, who has served as technical manager of several leading paper converting firms, has, with the aid of many contributors, collected recent information on the chemicals used in paper coatings, their suitability for special applications, new processes, improved and simplified machinery, and time-saving testing methods for the evaluation of specialty-paper products. Every major branch of paper converting is treated by an expert who is actively engaged in that phase of the industry. Theoretical considerations are subordinated to the practical aspects.

The book emphasizes the contributions of cellulose lacquers, synthetic resins and plastics, natural and synthetic rubbers, new adhesives and pigments to the production of decorative and functional effects on paper. It describes many available processes and a wide range of substances which make possible the manufacture of similar or identical products by different methods and/or from different starting materials.

Over 150 illustrations (mostly line drawings and diagrams) and 100 tables are given. Hundreds of literature references are included.

STANDARDS OF TUBULAR EXCHANGER MANUFACTURERS ASSOCIATION. Third Edition. Published by Tubular Exchanger Manufacturers Association, 53 Park Place, New York 7, N. Y. 8½ x 11. 162 pages. $5.50 postpaid.

The material in the 1949 edition has been revised and expanded, with additions to the mechanical and thermal standards, to conform with current findings and conclusions of the TEMA Technical Committee. Two entirely new sections have been added, one giving the mechanical standards for alloy steel heat exchangers and the other, general information valuable to designers, fabricators and users of heat exchangers.

The new edition incorporates complete mechanical standards for alloy steel construction known as Class A. A general information section has been added, bringing together in one volume with the TEMA Standards, data formerly obtainable only from scattered sources, and tables just recently made available on maximum allowable stress values of carbon, low and high alloy steels, nickel and high nickel alloys, copper and copper alloys, carbon and low alloy steel pipe and tubes.

HANDBOOK OF ENGINEERING FUNDAMENTALS. Second Edition. Edited by Dean Ovid W. Eshbach, Northwestern Technological Institute. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 1324 pages. $10.00.

Thirty-nine distinguished scientists contributed to this completely revised reference book covering all phases of engineering. The discussions on mathematics, thermodynamics, and fluid mechanics have been entirely rewritten or revised. Similar treatment has been given to the sections on electricity and magnetism, engineering materials, and engineering law. Also, the tables have been revised and new tables have been added.

Booklets and Pamphlets

APPLICATION OF OVERFIRE JETS TO ABATE SMOKE FROM STATIONARY PLANTS. (BCR Aid to Industry 500-300.) Published by Bituminous Coal Research, Inc., 2609 First National Bank Bldg., Pittsburgh 22, Pa. 24 pages. 8½ x 11. 50 cents. This is the first in a series of publications, known as "BCR Aids to Industry," to assist coal users in getting maximum satisfaction from the use of coal. This booklet is a revision of Technical Report VII.

A THEORY OF THE MECHANISM OF RUSTING OF LOW ALLOY STEELS IN THE ATMOSPHERE. By H. R. Copson. Published by International Nickel Co., Inc., 67 Wall St., New York 5, N.Y. 38 pages. 6 x 9. This booklet, which is a reprint from the proceedings of the American Society for Testing Materials, Vol. 45, 1945, presents results from exposure tests on 71 low alloy structural steels exposed in industrial and marine atmospheres and the new theory of the mechanism of rusting which resulted from these findings.

LET'S LOOK IT UP. Published by Reinhold Publishing Corp., 330 West 42nd St., New York 36, N.Y. 77 pages. This complete new 1952 catalogue describes in detail the books of the Reinhold Publishing Corp., including all the American Chemical Society Monographs. It covers the latest books in the fields of chemical engineering, industrial chemistry, colloid chemistry, oils and waxes, rubber and gums, paint, paper, cement, etc.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Roller Chain. Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.—The new 148-page roller chain engineering data book No. 2457 contains detailed engineering information covering the selection, installation, lubrication, and maintenance of roller chain for drives and conveyors, and sprocket wheels. Contained in this book are many photographs and line drawings of the many types and sizes of chain and sprocket wheels available in the Link-Belt precision steel roller chain line. Fifty typical conveyor chain attachments are shown. Also included are formulas, charts, diagrams and typical problems.

Centrifugal Pumps. Allis-Chalmers Mfg. Co., General Machinery Div., Milwaukee 1, Wis.—Three 35mm sound filmstrips on centrifugal pumps, each with a running time of about 30 minutes, are now available. The film "How and Why of Centrifugal Pumps" shows parts and nomenclature, theory of operation, measurement of characteristics, and interpretation of curves. The "Pump Maintenance" film illustrates how to set up a centrifugal pump, starting procedure, lubrication, packing maintenance, mechanical seals, piping tips and

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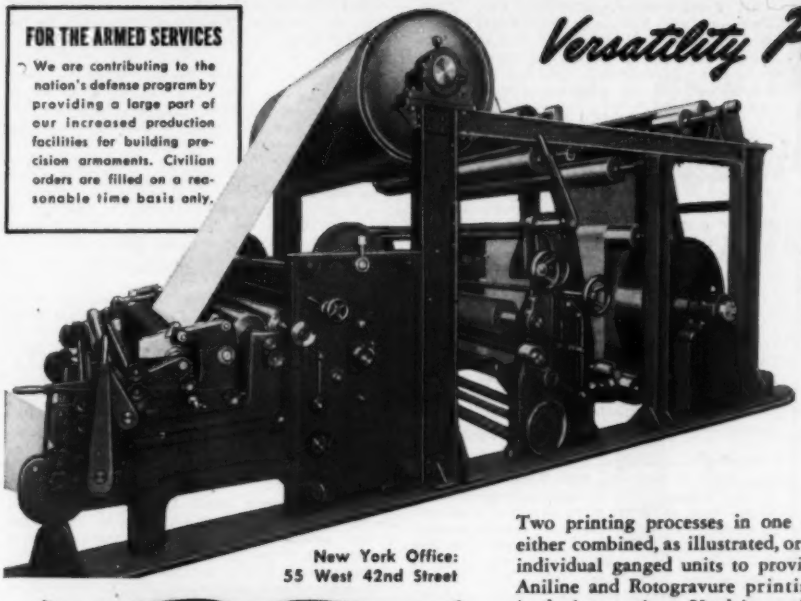

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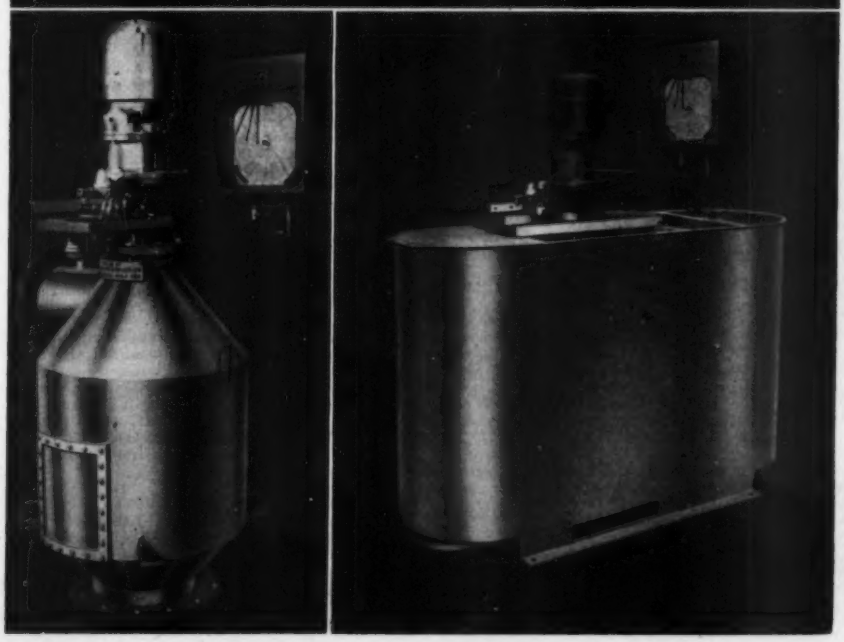

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the keeping of operating records. The film "Covering All Angles" describes the selection of a pump and gives information required to figure its installation.

Industrial Magnifiers. Bausch & Lomb Optical Co., 558 Bausch St., Rochester 2, N. Y.—Designated as Publication I-67, this 24-page authoritative guide, titled "Industrial Magnifiers—How to choose and use them," outlines the optical principles of magnifiers in easily understandable language, describes the basic types, tells how to use and care for them, and includes a magnifier selector chart and glossary. It is illustrated with more than 50 photographs and diagrams. Specifications of 75 magnifiers for a wide variety of industrial and professional uses are given in detail in a magnifier selector index.

Fans. Chelsea Fan & Blower Co., Inc., 639 South Ave., Plainfield, N. J.—A catalogue, price sheet and engineering bulletin describing 30 fan types in over 300 sizes has recently been issued. Included are complete specifications, dimensions, installation diagrams and product photographs, as well as extensive information on the proper selection and installation of fans for every industrial, commercial and residential requirement.

pH Control for Paper Stock. Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.—Revised 12-page Bulletin ND4-96-709D describes how pneumatic control, using a Speedomax electronic recording instrument, automatically adjusts the flow of reagent to maintain pH at optimum value. Photo-diagrams illustrate how the equipment is being applied to Fourdrinier machines, for the control of stock or white water, and to cylinder machines. New features of Speedomax pneumatic design are graphically shown. The latest electrode assemblies of the flow type and the dip type are illustrated and described. There is also a brief description of electric control.

Enamel. Wilbur & Williams Co., 180 Lincoln St., Brighton 35, Mass.—A new brochure on odorless Dampcoat enamel shows 48 specialized for industry colors. Information is given on how to obtain any color desired.

Colorimeter. Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda 14, Md.—One-page leaflet (Catalogue No. 925) describes the Hellige Chromatron photoelectric colorimeter and turbidimeter.

Air Pumps. Eberbach Corp., Ann Arbor, Mich.—Bulletin 300 describes air pressure or vacuum pumps designed for laboratory applications, giving complete performance and size specifications, suggested uses and illustrated descriptions of the unmounted and motor-mounted models.

Controllable Capacity Pumps. Aldrich Pump Co., Allentown, Pa.—Six-page Data Sheet 65A describes applications, features, design, and operation of "Powr-Savr" controllable capacity pumps. Also included are sectional and dimension drawings, ratings, and a diagrammatic layout of the type "A" automatic hydraulic stroke-control system for boiler feeding, oil burner supply, and similar applications.

Photoelectric Equipment. De-Tec-Tronic Laboratories, Inc., 1711 Terra Cotta Place, Chicago 14, Ill.—This 4-page catalogue illustrates and describes a complete line of amplifier-relays and light source and phototube units with design standardized. Complete specifications are included.

Protective Coatings. Prufcoat Laboratories, Inc., 50 East 42nd St., New York 17, N. Y.—A new 4-page general catalogue covers the entire line of Prufcoat protective coatings. Included is a list of chemical agents against which Prufcoat has been found effective and case history studies of five different types of applications in as many different industries. The back page is devoted to a listing and brief description of the physical and protective qualities of all eight Prufcoat products.

Surface Tension Meter. Joseph B. Kushner, Electroplating School, 115 Broad St., Stroudsburg, Pa.—A new 4-page leaflet describes the "Sur-Ten" meter, a new surface tension measuring instrument.

Tubing. Tube Reducing Corp., Wallington, N. J.—Four-page Bulletin R-7 describes Rockrite cylinder-finish tubing. Illustrated typical applications and data table on various tube sizes frequently met in user specifications are given.

Four-rope Buckets. Blaw-Knox Co., Bucket Dept., Pittsburgh 30, Pa.—This 44-page bulletin, No. 2392, lists ten vital items for guidance of a prospective purchaser of a 4-rope bucket. It explains how to prepare an inquiry. There are numerous illustrations of bulk material handling, with performance data and comparisons of cargo dispatch and discharging vessels, barges and railroad cars. Information and diagrams are presented on 4-rope bucket types, reeving, etc.

Cable. Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio—This 4-page bulletin, No. BA-927, describes the Armortube flexible protected tube cable. Many illustrations are included, in addition to tables showing tubing specifications and tubing fittings.

Instrumentation. Minneapolis - Honeywell Regulator Co., Station 40, Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.—"Centralized Instrumentation Unlimited," Bulletin 85-20, consisting of 32 pages, describes conventional and graphic-type panelboards, as well as the measuring and control instruments utilized.

Masonry Coating. Arco Co., 7301 Bessemer Ave., Cleveland 27, Ohio—A new 20-page booklet on Dum-Dum Masonoc, heavy "self-healing" protective coating, is now available. Large illustrations showing restoration and protection of 19 different types of masonry structures against attacks of wind, weather, fumes and heat constitute the greater portion of the booklet. Several "before-and-after" photos are included.

Titrimetry. Burrell Corp., 2223 Fifth Ave., Pittsburgh 19, Pa.—This 4-page bulletin, B-223, describes the Coleman Autotrator for automatic titrations (Model 19).

Resin. Bakelite Co., Div. of Union Carbide & Carbon Corp., 300 Madison Ave., New York 17, N. Y.—Preparation, properties and uses of the new formulation of Vinylite dispersion resins known as plastigels are described and illustrated in a new booklet. Technical data are presented in 16 pages of text, photographs and graphs.

Digesters. Graver Tank & Mfg. Co., Inc., East Chicago, Ind.—The *Echo*, Vol. 8, No. 4, features as its lead story, a 5-page article describing the installation of five Graver stainless-clad digesters at Riegel Paper Corp., Acme, N. C. Other features include an inspection report of an expansion roof tank after a decade of service, and articles on the deaerating heater, pontoons used in opening of Canadian iron ore deposit, erection of a steel stack, and Graver installations in Cuba and Mexico.

Tachometers. Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.—Technical Data Sheet No. 42 HJK describes the Type 42H, 42J and 42K spread scale tachometer indicators, giving typical applications, outstanding features, principle of operation, selection of indicators and heads, installation and use, and ordering instructions. Photographs, diagrams, and a table of speed ranges, recommended indicators and recommended heads are included.

Wet-Strength Resin. Hercules Powder Co., Wilmington, Del.—A small folder describing the advantages of using Kymene, a wet-strength resin, to obtain better wet-strength paper bags is now available. In addition to a sample of bag paper containing Kymene taken from a commercial run in a mill, the folder includes test data.

Lift Truck. Raymond Corp., 8090 Madison St., Greene, N. Y.—The latest model hydraulic high lift truck is shown in a new 2-page bulletin, No. 242. Drawings suggesting common applications and photographs showing actual on-the-job uses for the truck are given. Line drawings show all dimensions, and the specifications are described in detail.

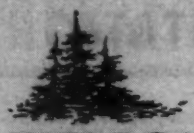
Mechanical Tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.—The advantages of using tubing in the production of hollow precision parts are outlined in a new 4-page bulletin, TB 339, on seamless cold-drawn carbon steel mechanical tubing. Tables of tolerances and mechanical properties of such tubing are presented.

Protective Coatings. Insul-Mastic Corp. of America, 1141 Oliver Bldg., Pittsburgh 22, Pa.—This 44-page catalogue entitled "Insul-Mastic In Industry" describes Gilsonite base protective coatings, their properties, their uses and tests to which they have been subjected. A special cork filled coating is also described, in addition to related products such as caulking compounds, primers and membraning material. Photographs of chemical vessels, industrial equipment and buildings which have been protected by these coatings are shown.

Instrument Sensing Units. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.—Prices, application recommendations and pertinent information concerning instrument sensing units and associated accessories are contained in the new 42-page 1952 edition of the Wheelco Data Book and Catalogue, TC-9. Essential data pertaining to making, checking, selecting and ordering thermocouples, wire sizes and resistances and temperature-millivolt are included.

Motor-Drive Accessory. Reliance Electric & Engineering Co., 1111 Ivanhoe Rd., Cleveland 10, Ohio—An electronic motor-drive accessory that provides timed-rate acceleration and deceleration is described and illustrated in a new, 2-page bulletin, K-2025, which explains the four specialized functions of VSC and shows it in action on a textile slasher drive and a turret lathe.

Rod Packings. Garlock Packing Co., Palmyra, N. Y.—A new 8-page bulletin outlining the advantages of Lattice-Braid rod packing contains sectional drawings showing the structure of Lattice-Braid packings, illustrations of different types, tables showing general service recommendations and specifications, and reports from users.



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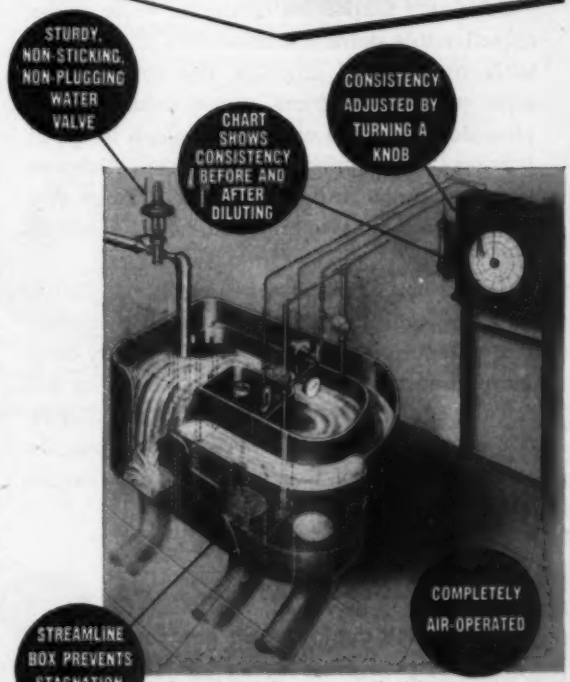
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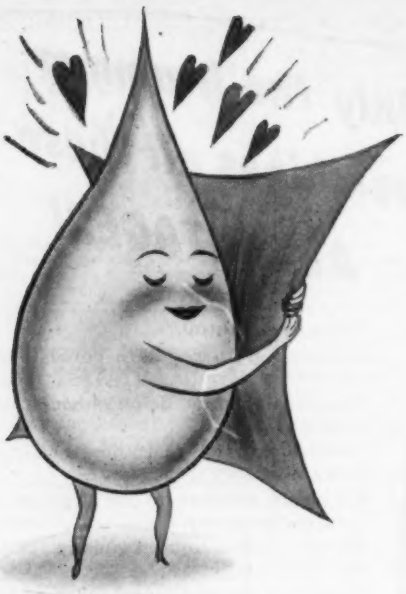

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MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

Current quotations to mills, f.o.b. New York:

Blue Overalls	10.00	to	10.50
Washables, No. 1	4.75	to	5.00
Light prints, No. 1	8.25	to	8.50
Khaki Cuttings, Mixed	5.25	to	5.50
Canton Flannels, Bleached	14.50	to	15.00
Canton Flannels, Unbleached	14.50	to	15.00
White Shirt Cuttings, No. 1	15.00	to	15.50
Silesias, No. 1	11.50	to	12.00
New Unbleached Muslins	15.50	to	16.50
Fancy Shirt Cuttings	7.50	to	8.00
American Linen Cuttings	12.00	to	12.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.		
Roofing—			
No. 1	1.25	to	1.30
No. 2	.95	to	1.05
No. 3 and 4	.80	to	.90
Twos and Blues—			
Repacked	2.75	to	3.00
Thirds and Blues—			
Repacked	2.25	to	2.50
Miscellaneous	1.75	to	2.00
Whites, No. 1—			
Repacked	6.00	to	6.25
Miscellaneous	5.00	to	5.25
White, No. 2—			
Repacked	4.75	to	5.00
Miscellaneous	4.00	to	4.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.		
Gunny No. 1—			
Foreign	5.25	to	5.50
Domestic	5.50	to	5.75
Wool Tares—			
Light	6.25	to	6.50
Heavy	6.50	to	6.75
No. 1 Scrap Bagging	4.75	to	5.00
Manila Rope—			
No. 1 large	7.50	to	8.00
No. 1 small	6.50	to	7.00
Sisal Rope—			
No. 1 large	6.50	to	7.00
No. 1 small	6.00	to	6.25
New Burlap Cuttings	6.50	to	7.00
Jute Threads—			
Foreign (Nom.)	7.00	to	7.50
Domestic	7.00	to	7.50
Strings—			
No. 1 sisal	6.00	to	6.50
No. 2 sisal	5.50	to	5.75
Soft jute	5.75	to	6.00
Mixed	3.50	to	3.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton		
Shavings—			
Hard White Env. Cuts	120.00	to	125.00
Hard White No. 1	80.00	to	85.00
Soft White, one-cut	75.00	to	80.00
Soft White, No. 1	60.00	to	65.00
Soft White, Misc.	35.00	to	40.00
Fly Leaf No. 1	25.00	to	30.00
Fly Leaf, Woody No. 1	25.00	to	30.00
No. 2 Mixed Col. Woody	20.00	to	22.50
Flat Stock—			
No. 1 Heavy Books and Magazines, Repacked	20.00	to	22.00
Mixed Books	14.00	to	15.00
Ledger Stock—			
No. 1 White	50.00	to	55.00
No. 1 Mixed (Colored)	30.00	to	35.00
Manilas—			
New Env. Cuttings	55.00	to	60.00
New Env. Cuts, One-Cut	—		
Extra Manilas	22.50	to	25.00
Manila Tab Cards, Free of Ground Wood	65.00	to	70.00
Colored Tab Cards	45.00	to	50.00
Kraft—			
New Envelope Cuttings	60.00	to	65.00
Tripled Sorted No. 1 100%	40.00	to	45.00
No. 1 Old Assorted	27.50	to	30.00
News—			
White Blank	65.00	to	70.00
Overissue	23.00—		
No. 1 Folded	15.00—		
Old Corrugated Containers	15.00—		
New Jute Corrugated Cuts	20.00—		
Mill Wrappers	10.00—		
Box Board Chips	9.00—		
No. 1 Mixed Paper	8.00—		

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—			
Lump, cwt.	4.55—		
Ground, cwt.	4.30—		
Powdered, cwt.	4.70—		
Blanc Fixe—			
Pulp, bulk, ton	90.00—		
Dry, barrels	95.00—		
Bleaching Powder—			
Drums, cwt.	5.90	to	6.90
Casein (Domestic Standard)			
20-30 mesh (bags), lb.			
80-100 mesh (bags), lb.	28.00—		
Argentine, lb.	19.50—		
China Clay—			
Domestic Filler Bulk (mine) ton	10.00	to	15.00
Domestic Coating Bulk (mine) ton	15.00	to	25.00
Imported (ship side) Bulk (lump) ton	22.00	to	30.00
Chlorine—			
Tanks cars (wks) cwt.	2.70—		
Gelatine (silicin), lb.	1.25	to	1.35
Glyc. (C.P.) drums, lb.	34.00	to	34.50
Litharge, powd. bbl. lb.	.17¾	to	.18¾

MARKET QUOTATIONS

	New York, per 100 lbs.	
Rosin (Gum)—		
E	8.45—	
F	8.45—	
G	8.45—	
WW	8.70—	
Rosin (Wood), carlots,		
F.O.B. South	4.35 to	4.50
Salt Cake—		
Dom. bulk (wks) ton	17.00 to	23.00
Imp. bulks on dock—(Atl. ports) ton (Nom.)	25.00—	
Soda Ash—		
Bulk (works) cwt.	1.30—	
Paper bags, cwt.	1.50—	
Soda (Caustic)—		
Solid drums, cwt.	3.35 to	3.40
Ground and flaks, drums, cwt.	3.75 to	3.85
Sodium Silicate—		
60 deg. 55 gal. drums, (works) cwt.	1.60 to	1.70
40 deg. 55 gal. drums, (works), cwt.	1.30 to	1.40
Starch—		
Pearl, 140 lb. bags, cwt.	6.44—	
Pearl, barrels, cwt.	6.44—	
Paper (Sp.) bags, cwt.	6.44—	
Powdered, barrels, cwt.	6.65—	
Sulphur (Crude)		
(Mine) bulk, long ton	21.00 to	22.00
Talc—		
Dom. 100 lb. bags (mine) ton	35.00 to	38.00
Canadian	35.00 to	45.00
Titanium Dioxide—		
Barium Pig, bbls., lb.	.21 to	.21½
Calcium Pig, bbls., lb.	.21 to	.21½
Zinc Sulphide, bbls., lb.	11.50 to	11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite	140.00—
Unbleached sulphite	132.50—
Bleached sulphate	145.00—
Semi-bleached sulphate	140.00—
Unbleached sulphate	132.50—
Bleached soda	140.00—
Ground wood	92.50—
Sulphite screenings	72.50—
Sulphate screenings	67.50—
Ground wood screenings	60.00—
Unbleached sulphate siderunn	132.50—
Standard news print siderun	92.50—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, follow:

Bleached sulphite	225.00—
Bleached sulphate	230.00—
Unbleached sulphite	200.00—
Unbleached sulphate	200.00—

Current quotations on imported wood pulp, dollars per short air dry ton, on dock American Atlantic ports follow:

Bleach. sulphite, Canadian	150.00—
Bleach. sulphite, Swedish	140.00—
Bleach. sulphite, Norwegian	140.00—
Bleach. sulphite, Finnish	140.00—
Unbl. sulphite, Canadian	140.00—
Unbl. sulphite, Swedish	125.00—
Unbl. sulphite, Finnish	122.00—
Blch. kraft, Canadian	150.00—
Blch. kraft, Swedish	145.00—
Unbl. kraft, Canadian	100.00—
Unbl. kraft, Swedish	115.00—
Unbl. kraft, Finnish	105.00—

PAPER

Boards—

OPS ceiling prices (CPR 108) per ton, delivered consumer's mill, 10 tons or more:

Plain chip	90.00—
News vat lined chip	92.50—
Filled news	90.00—
Solid news	102.50—
White vat lined chip	132.50—
Chip tube and can stock	100.00—
Single manila lined chip	137.50—
Single jute lined chip	135.00—
White patent coated:	
.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

OPS ceiling prices (CPR 108) per cwt.:

Coated two sides		
70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides	4 cases	$17.25
	Carloads	$16.30
45 lb. enamel, 25x38-500, trimmed 4 sides	4 cases	$13.05
	Carloads	$12.10
Uncoated		
55 lb. No. 2 offset, 25x38-500, trimmed 4 sides	4 cases	$14.80
	Carloads	$13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases	$14.05
	Carloads	$13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads	$12.40
16 lb. tablet, 17x22-500	Carloads	$11.35

Rag Content Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Extra 100% rag	57.50	58.50
100% rag	49.50	50.50
75% rag	38.00	39.00
50% rag	29.50	30.50
25% rag	24.00	25.00

Rag Content Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

Extra 100% rag	58.50
100% rag	50.50
85% rag	42.00
75% rag	39.50
50% rag	30.50
25% rag	25.00

Sulphite Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Air dry bond (Watermarked)	20.00	21.00
No. 1 bond (M.F. watermarked)	15.50	16.20
No. 2 bond (M.F. watermarked)	14.90	15.60
Plain bond (M.F. unwatermarked)	14.00	14.60

Sulphite Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

No. 1, M.F. watermarked	16.50
No. 2, M.F. watermarked	15.90
Plain, M.F. unwatermarked	15.00

Glassine (f.o.b. mill)—

OPS base ceilings (CPR 76):	per cwt.
25 lb. base No. 1 bleached glassine	22.50—
25 lb. base No. 1 bleached greaseproof	20.00—

News—

	per ton
Rolls, Standard (Contract)	116.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	131.00—

Tissues (Carlots)—

	per ream
White No. 1	1.90—
White No. 2	1.60—
Bleached Anti-Tarnish	—
Colored	2.00—
Anti-Tarnish Kraft	1.90—
Manila	2.00—
Napkins, semi-crepe (12¼ lb. to M shts.) per cs.	.80—
Napkins, full crepe and embossed (12¼ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	10.00—
Toilet, Unbleached (M shts.) per cs.	8.00—

Towels

	per case
Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)—

OPS ceilings, per cwt., 50 lb. base weight:	per cwt.
Standard wrapping	7.75—
Butchers, counter rolls	8.25—
Standard bag, mill rolls	7.50—
Shipping sack, mill rolls	7.75—
Gumming, mill rolls	8.00—
Asphalting, mill rolls	7.75—
Envelope, mill rolls	9.25—

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FOR PUMPING HOT AND COLD, CLEAR AND VAPOROUS LIQUIDS

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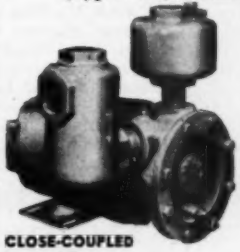

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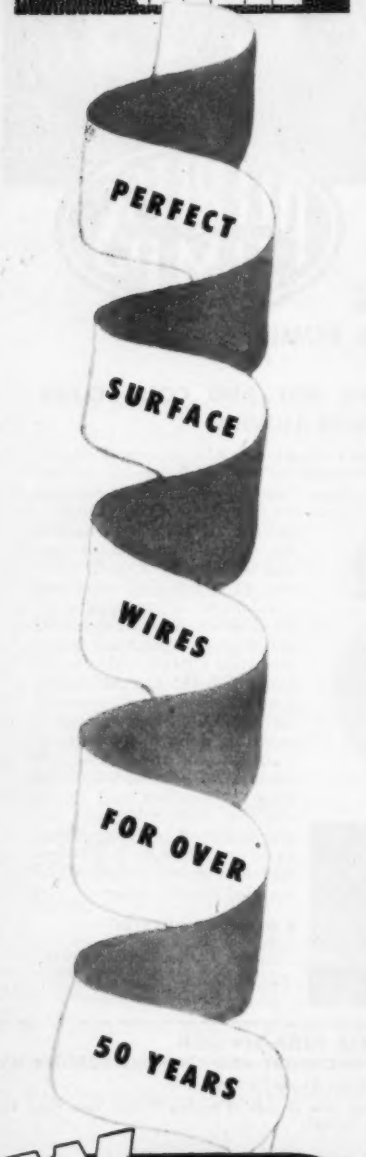

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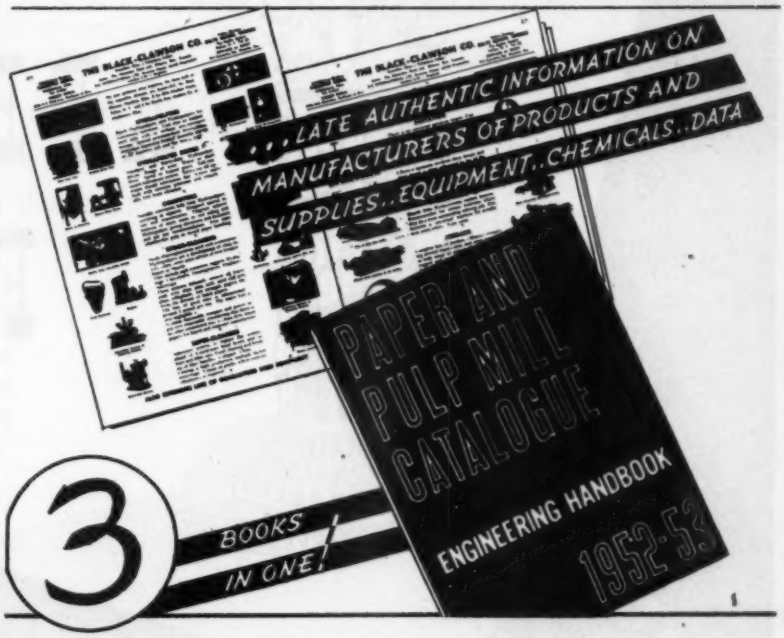
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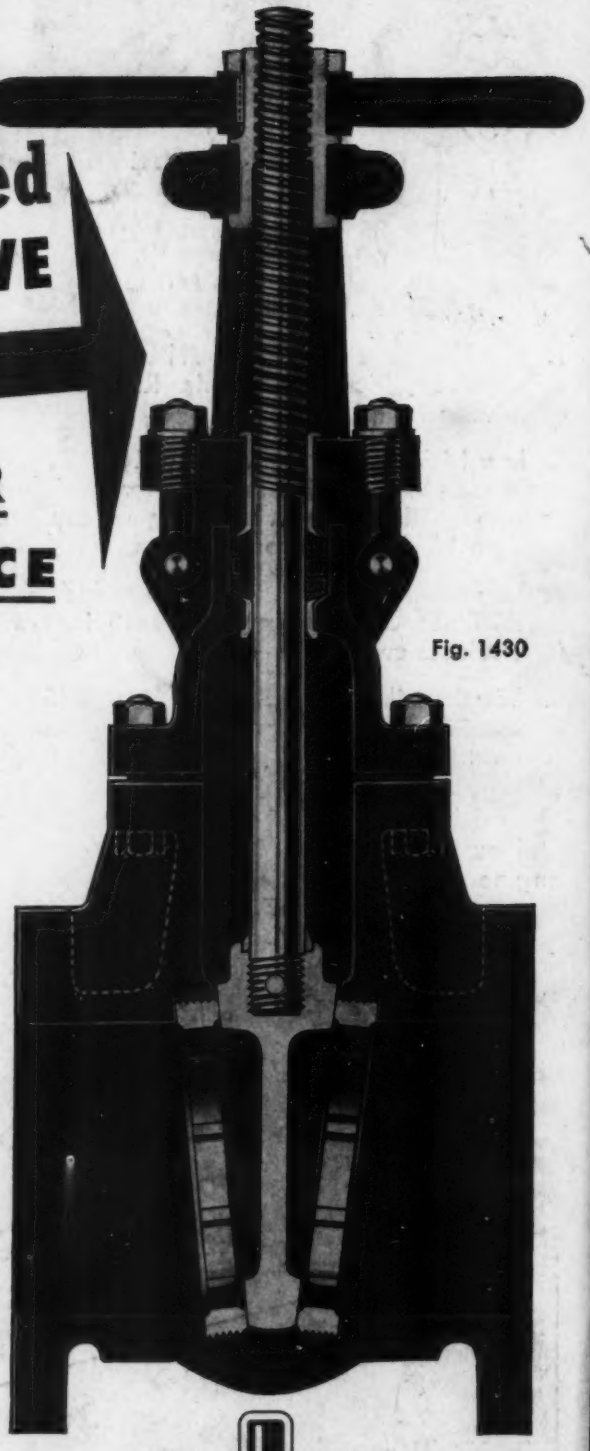

Fig. 1430

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